

WHITE PAPER

Networking Skills in Turkey, the Middle East, North Africa, and Pakistan

Sponsored by: Cisco

Margaret Adam

May 2013

IDC OPINION

The region covered in this report – Turkey, the Middle East, North Africa, and Pakistan – is diverse. While many countries in this region share some commonalities in terms of culture and religion, they are very economically and geographically different. What is consistent, however, among most, if not all, of these countries is that they all have very young populations.

Most of these governments also acknowledge that, in order to be globally competitive in the future, their economies need to be able to transform into technologically advanced knowledge economies. Enabling this transformation requires a significant amount of investment in skills because, without the availability of the right kind of skills, technological progress will not necessarily translate into economic growth and global competitiveness. Job creation and skills development, therefore, form critical components of most national government agendas in the region.

At the same time, the ICT industry is facing significant skills challenges on a global scale. The pace of change, complexity of evolving technologies, and rapid adoption of ICT in emerging markets are only adding to this pressure. Both government and private sector organizations are grappling with the challenge of finding, retaining, and developing the right kind of skills to be able to leverage these technological advances to achieve a competitive advantage.

In this increasingly inter-connected world, next-generation technologies rely heavily on a robust, speedy, and pervasive foundational network. As it stands today, technology trends such as video and voice-over-IP (VoIP), proliferation of mobile and other IP-devices, virtualization, and cloud computing all have a direct and very immediate impact on the network, leading to investment in upgrades to make network infrastructure more converged, more intelligent, more flexible, and more robust. Networking is becoming increasingly fundamental to next-generation technologies, and enterprises are faced with the challenge of adding more intelligence to their networks to be able to handle increasing traffic flows, complex transactions, and increasingly demanding applications and to deliver quality of service in line with the demands of modern technology users. And in order to do this effectively, organizations need not only sufficient networking skills but also the skills to adapt to the ever-changing requirements of technology.

The results of the research conducted for this IDC White Paper support this assertion, with organizations in Turkey, the Middle East, North Africa, and Pakistan showing an increasing need for people with networking skills, particularly those skills to support emerging technology trends and therefore bring innovation to businesses. Demand for networking skills across Turkey, the Middle East, North Africa, and Pakistan currently surpasses supply and will continue to do so over the next five years. In particular, networking skills related to emerging technologies will be in short supply in many countries in the region. Unless these gaps are addressed, many of these

countries will struggle to leverage technology effectively and therefore to gain the competitive advantage necessary to compete in a far more connected global economy.

EXECUTIVE SUMMARY

IDC is keenly aware of the increased discussion about a lack of skills in specific areas in the IT industry. In late 2007, IDC developed a research initiative around the skills gap in various areas of the IT industry, which we are now refreshing in order to track and reflect new market developments. In IDC's opinion, the nature of the skills gap in 2012 and beyond is very different from what was observed some years ago.

IDC conducted 574 interviews in seven countries: 150 interviews in North Africa: in Egypt (100) and Morocco (50); 374 in the Middle East: in Jordan (50), Saudi Arabia (100), and the United Arab Emirates (105); 119 in Turkey; and 50 in Pakistan. These interviews were further segmented by the number of employees (100–249, 250–499, 500–999, and 1,000+) and by type of industry: natural resources, education, finance, government, healthcare, manufacturing, media/broadcasting and publishing, professional and personal services, retail and wholesale, travel/transportation and distribution, telecommunications/Internet services, and IT (networking services and support and systems integration). The respondents were selected based on their responsibility for network infrastructure and management of professionals involved in network design, operations and maintenance, and deployment and support. The results from this survey were analyzed in conjunction with data from a number of IDC's ongoing research programs around networking and relevant related information technologies. This document explores the results of this research and analysis.

During the course of this research, IDC specifically focused on how converged IT infrastructure is shaping enterprise networks and explored the growth and demand for professionals with both essential and emerging networking skills. Essential networking skills include: wireless, VoIP, network security, and general networking skills (routing and switching). Emerging networking skills include skills for: unified communications, video, cloud computing, mobility, datacenter, and virtualization. Based on the results of the survey, a critical short supply of networking skills is clear in across the region, and demand currently outstrips supply. This is particularly true of emerging technology and cross-technology skills. This gap will only widen over the forecast period and will be heavily impacted by the following trends:

- ☒ Demand for greater efficiencies within IT infrastructure, with virtualization playing an increasingly important role
- ☒ The proliferation of devices, both wired and wireless, with mobile – specifically, tablets and smart phones – making a significant impact
- ☒ The need for intelligent networks, sufficiently robust to support video, remote delivery of automated services, and virtualized and cloud workloads

The different types of networking skills assessed in this document include:

- ☒ **Total Networking Skills Gap:** These skills are the aggregation of essential and emerging networking skills. In 2012, IDC estimated a shortage of 47,945 full-time equivalents (FTEs) with networking skills across the seven countries included in this research. This number will increase to 129,862 by 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 26.2% in 2012 and 39.7% in 2016. The number of skilled people is based on IDC's proprietary skills model, which calculates FTEs, which are defined as IT

professionals spending 100% of their work time working with networking technologies.

- ☒ **Essential Networking Skills:** These skills are basic or core networking, network security, IP Telephony, and wireless networking skills, and they represented 61.6% of the total FTEs skills gap in 2012 and will account for 53.7% in 2016. IDC estimated a skilled-people shortage of around 29,525 FTEs in 2012, increasing to 69,718 FTEs in 2016. These figures represent an increasing FTEs skills gap of 22.9% in 2012 and 35.7% in 2016. The rapid adoption of networking technologies by organizations throughout the region is continuously driving demand for these skills, causing the gap to widen at a compound annual growth rate (CAGR) of 24% from 2012 to 2016.
- ☒ **Emerging Networking Technology Skills:** These are skills in technologies such as unified communications, video, cloud computing, mobility, datacenter, and virtualization and represented 38.4% of total FTEs skills gap in 2012, growing to 46.3% in 2016. Within this group of skills, IDC estimated a FTEs shortage of skilled-people of around 18,421 FTEs in 2012, increasing to 60,144 FTEs in 2016. These figures represent a projected incremental skills gap of 34% in 2012 and 45.6% in 2016. As these technologies ramp up and gain a stronger foothold within organizations across the region, demand for these skills will result in the gap widening at a CAGR of 34.4% during 2012–2016.

Other Key Findings:

- ☒ **Saudi Arabia the Most Challenged in Terms of Skills Shortages:** Unsurprisingly, countries with large populations, such as Turkey (with a population of approximately 74 million) and Pakistan (approximately 177 million people) tend to fare better in terms of skills availability than smaller countries. Pakistan, for example, had a total networking skills gap of 9.6% in 2012; in Turkey, the gap was 17% in 2012. The exception to this is Saudi Arabia, which is not a small country; in fact, it has the largest population in the Gulf (approximately 28 million), but it faces the most severe skills challenge, with a total networking skills gap of 73% in 2012. The reasons for this gap are detailed in the country analysis section of this report, but the gap is largely due to a lack of technically qualified Saudi nationals, resulting in Saudi organizations having to rely on an expatriate and often temporary (fly-in) IT workforce. At the same time, Saudi Arabia has very strict visa regulations and a strong nationalization agenda, which further exacerbate the challenge of accessing skilled networking professionals.
- ☒ **Increased Demand for Security Skills:** Security skills are in high demand in Turkey, the Middle East, North Africa, and Pakistan. When asked what new or extra skills would be required in the next 12 to 24 months, 69.3% of respondents indicated that they would require more security skills. Security is an area that requires niche and specialized expertise. It is also an area that is constantly changing in response to evolving security threats. Network security professionals therefore require significant training and experience and a dedicated focus. These skills are in short supply in Turkey, the Middle East, North Africa, and Pakistan, precisely because of the level of specialization and training required. This short supply is exacerbated by the fact that demand for security skills accelerates when security breaches escalate. For example, a number of high profile Middle Eastern organizations (including RasGas, Saudi Aramco, and Al Jazeera) have recently been victims of politically motivated cyber attacks; this is likely to be one of the reasons behind this accelerated demand in the region.

- ☒ **Communication Skills an Issue:** Many countries, particularly those in the Gulf Cooperation Council (GCC) countries, such as Saudi Arabia and United Arab Emirates, rely heavily on expatriate IT workforces. Many of these expatriate IT workers are from countries in the Indian sub-continent and the Philippines, where English is the second language; they are not Arabic speakers. This can lead to communication challenges, which is reflected in the results of the research, whereby the majority of respondents (74%) listed communication skills as the skills most needed in addition to technology skills.
- ☒ **Vendor Certifications:** Very high importance is placed on vendor certifications in Turkey, the Middle East, North Africa, and Pakistan, and the importance of certification is growing, with 36.8% of respondents believing that it will become far more valuable for people in their organizations with networking skills to have professional certifications and 42.3% believing professional certifications are very important when choosing a service provider. Because the quality of skills across the region is inconsistent and the quality of service delivery has historically been quite poor, many organizations rely on professional certifications to give them some kind of benchmark or quality assurance when hiring a networking professional or when using the services of a third-party networking services provider.

METHODOLOGY

In the second half of 2012, IDC conducted a survey and combined it with a supply-side study to analyze the current status for both the demand side and the supply side of networking skills in the seven countries covered. The study provides an update to the one conducted by IDC in 2007. In addition to the previously measured essential networking skills – wireless, VoIP, network security, and general networking skills (routing and switching) – IDC has introduced analysis of other technologies that, while enabling new capabilities and advantages, introduce new challenges with regard to management, maintenance, and support of the network. IDC has identified these as emerging networking skills, and they are: unified communications, video technologies, cloud computing, mobility technologies, and datacenter and virtualization.

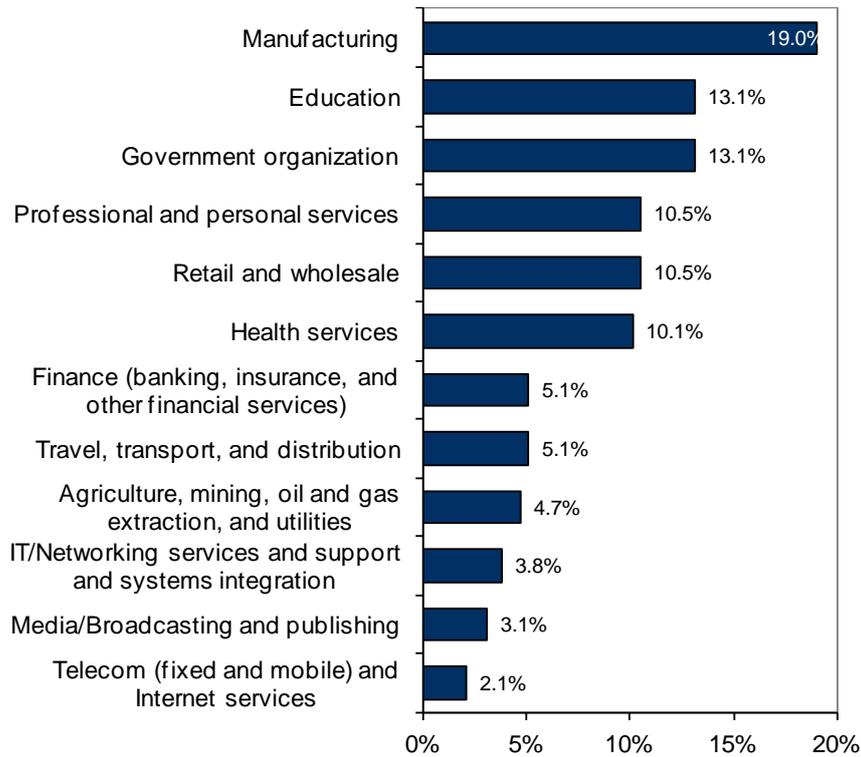
The countries analyzed are Egypt, Morocco, Turkey, Jordan, Saudi Arabia, the United Arab Emirates, and Pakistan.

IDC leveraged the results of an end-user survey conducted from May to July 2012 to define current and future trends related to the use and development of networking skills, as well as the role of the network in organizations in the region.

The respondents represent organizations of 100+ employees in the following verticals: natural resources, education, finance, government, healthcare, manufacturing, media/broadcasting and publishing, professional and personal services, retail and wholesale, travel/transportation and distribution, telecommunications and Internet services, and IT (networking services and support and systems integration). The respondents were selected based on their responsibility for network infrastructure and the management of professionals involved in network design, operation and maintenance, and deployment and support.

FIGURE 1

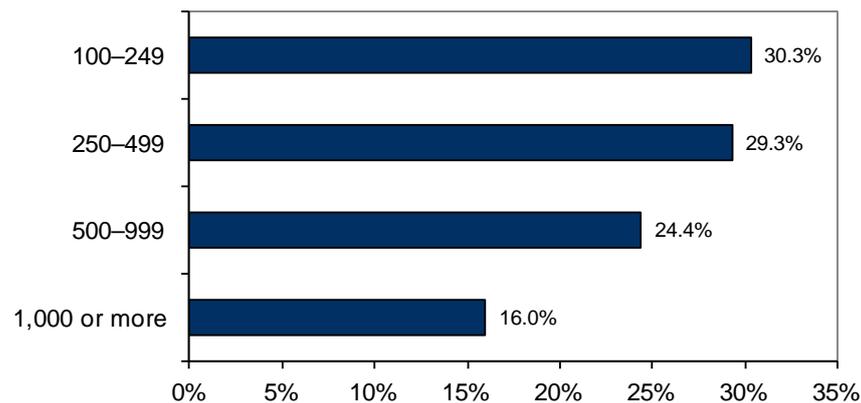
Survey Demographics: Industry Types



Source: IDC, 2013 N = 574

FIGURE 2

Survey Demographics: Employee Numbers



Source: IDC, 2013 N = 574

The survey data has been used to populate IDC's skills model and to make market predictions. The model is based on economic and statistical indicators in each country, including gross domestic product (GDP), IT workforce estimates, population growth, registered companies, as well as forecasts from IDC's syndicated studies such as EMEA Quarterly Ethernet Switch and Router Tracker, EMEA Quarterly

WLAN Tracker, EMEA Unified Communications, EMEA Quarterly Server Virtualization Tracker, EMEA Quarterly Mobile Phones Tracker, EMEA Quarterly Security Appliances Tracker, EMEA Quarterly PC Tracker, and Worldwide Black Book. Please refer to the Appendix for a more detailed methodology description and glossary.

IN THIS WHITE PAPER

This White Paper provides an update of the analysis carried out by IDC in 2007, and stems from a combination of regional and local analysis of survey results coupled with the IDC Skills Model, which together result in an accurate picture of the current situation as well as future trends.

The economies under analysis in this white paper across Turkey, Middle East, North Africa, and Pakistan, are continuing to grow steadily, and a significant number of companies and government bodies are expanding operations or renewing an outdated IT infrastructure, and adopting new technologies in order to increase competitiveness. The network is taking a more important role for companies in many verticals, taking a crucial role in the business processes. 96% of respondents to our survey reported the network will become more important for their organization in the future.

Beyond the typical role of connectivity for email and internet access widely adopted by companies, 66% of companies use the network to gain access to the organization from remote locations, and around 63% use the network for sharing process information within business relations, including key partners, suppliers and customers. Unified communications are gaining importance as more IP networks are deployed. According to an IDC survey, 51% of respondents use the network as a platform that enables employee collaboration using specific applications that combine mobile phones, video, applications and other tools. Given the importance of the network, survey results encouragingly indicate that organizations are investing as needed in skills development and formal technical training, with around 64% of the responding companies sending their staff to certification courses.

Areas experiencing the greatest pressure include security skills, with 69% of respondents considering extra security skills requirements for the next 12-24 months, followed by wireless network skills considered by 63% of the companies as an area to add extra skills. Datacenter Networking skills are third, with 57% of respondents considering investments in additional skills.

IDC found that an average of 71% of the companies interviewed believed that vendor certifications will become more important in the near future. Along those same lines, 73% of companies believe that service provider's staff must have professional certifications, a condition that will become increasingly important for them.

As a result of this, it is apparent that one of the most effective ways to combat the growing challenge posed by the lack of skilled staff at organizations is by increasing the number of students and professionals receiving formal training in all essential and emerging technologies.

SITUATION OVERVIEW

The Turkey, Middle East, North Africa, and Pakistan region is a diverse one. Countries in this region often differ greatly in terms of culture, ethnicities, population dynamics, economic maturity, political maturity and wealth. The region hosts impoverished countries, but also some of the richest (in terms of GDP per capita).

Making assumptions at a regional level can therefore be unreliable, for example, when comparing a very wealthy, but small country like Qatar, with larger and more economically challenged countries such as Egypt or Pakistan. However, what is consistent amongst most, if not all, of these countries is the fact that they all have a very young population. According to statistics published by the United Nations (UN), the median age of the population in Pakistan in 2010 was 21.1 years, Egypt: 24.4, 25.9 in Saudi Arabia and 26.3 in Morocco. The median age refers to the age that divides the population in two parts of equal size - i.e. there are as many people with ages below the median as there are above. Because of this young and burgeoning population, governments in most of these countries are actively pursuing strategies to generate jobs in high growth industries, such as the ICT industry. But the ICT industry is facing significant skills challenges on a global scale. The pace of change, complexity of evolving technologies and rapid adoption of these is only adding to this pressure with a slew of new and emerging technologies that will demand different and new skills than to what is already in short supply.

The increasing pervasiveness of the Internet, the rapid rise and transformation of mobile technologies, the volume and variety of data generated and the emergence and rapid consumption of cloud computing are all contributing to a massive transformation of the industry- the likes of which has not been since the transition from the mainframe to client-server and the introduction of the Internet. This transformation entails a shift to a new technology platform for growth and innovation. A platform built on and for mobile devices and applications, cloud, mobile broadband, big data analytics and social technologies. IDC predicts that at least 80% of the industry's growth will be driven by these third platform technologies and there will be an explosion of new solutions built on the new platform which will be rapidly consumed, specifically in emerging markets. At present, these technologies and related services, only account for 20% of IT spending, but are growing at six times the rate of traditional IT. This transformation is having a profound impact on not only the type of solutions available but also on how we procure and use these them.

While the gains that can be achieved from these new technologies are significant, the pace of change is a real concern for many IT heads who are struggling to balance their need to bring innovation into their organization against ensuring they have the right capabilities and skills to implement and manage these new technologies and still keep their operations running smoothly.

This challenge is compounded in emerging markets such as those found in Turkey, the Middle East, North Africa, and Pakistan, which are not immune to this transformation but where there is already an acute lack of advanced technical skills. This is further compounded by the fact that many of the countries in the region are experiencing rapid economic growth. At the same time, access to credit is still an issue and IT heads are faced with the unenviable challenge of ensuring they have sufficient IT resources to support the growth of their organizations, while budgets remain relatively flat and skills remain scarce.

Many of the governments in the region, particularly in the oil-rich Gulf States, such as Saudi Arabia and Qatar, are actively investing in infrastructure and policies to further encourage economic activity and diversify their economies away from a dependency on oil and gas revenues. Also given the demographics of these countries, there is a real need to increase private sector activity, develop skills and create jobs for their young and growing populations. Many of these governments are, therefore, investing in infrastructure to ensure that they are competitive on a global scale. They acknowledge that next generation – or third platform – technologies are highly dependent on a robust, cost-effective and fast communications infrastructure and so,

over the last decade, there has been significant investment in telecommunications networks and infrastructure and a number of projects initiated to improve IT literacy, penetration and usage in these countries to ensure global competitiveness.

There are a number of IT trends which are having a significant impact both globally and regionally. Anticipating the impact of these trends has to form part of planning in Turkey, the Middle East, North Africa, and Pakistan in order to ensure that the right investments are made in the underlying communications networks, so that they are future-proof and sufficiently robust to support the delivery of third platform technologies in their respective countries.

Building Intelligent Networks for new types of applications and services

As highlighted earlier, next generation technologies have a much higher dependency on communications networks and networks must now support a range of new applications and services. At the same time these networks need to be robust enough to ensure quality of service and secure enough to support a variety of new technologies. Mobile, voice and video and other forms of unified communications, wireless, virtualization, deployment of WLANs and Power over Ethernet (PoE) all burden the network. In order to ensure functionality and resiliency, there is a greater need to build intelligence into the network to control traffic flows, ensure quality of service, and ensure efficient application delivery which is aligned with the demands of the business whilst mitigating increasingly complex security threats. The mix of users, applications and variety & volume of data running on modern networks means that network security is a constantly evolving and critical area of focus for many organizations.

Optimizing Infrastructure through virtualization and automation

Adoption of virtualization has been significant in Turkey, the Middle East, North Africa, and Pakistan, because of the benefits it offers in terms of improving efficiency of existing infrastructure, increasing automation and facilitating faster delivery of computing resources. However, these high levels of automation mean an increasing dependency on the network, to support the delivery of virtualized workloads. Enterprise networks need to be designed to support application availability on virtualized systems and be intelligent enough to enable network managers to troubleshoot and manage problems related to virtual machines. Future proof networks will need to be active participants in policies and service levels of virtual machines and will require intelligence and enhanced security to achieve this.

Proliferation of devices

There has been explosive growth in the number and type of devices connecting to modern networks – both wired and wirelessly. This is particularly true of the latter with the unprecedented growth of smart phones and tablets. This will be further accelerated as BYOD (bring your own device) policies become more prevalent across Turkey, the Middle East, North Africa, and Pakistan. Being able to support and secure a growing array of devices is a real challenge, particularly given that the number of devices, applications and interactions will only accelerate. This will add complexity to networking environments and trends such as fixed-mobile convergence, 3G/4G offload, mobile collaboration tools and mobile device management and security will become more prevalent as IT organizations look to extend their infrastructure to intelligently and flexibly support this extended architecture.

Remote and automated service delivery

IDC has already seen massive growth in the usage of remote delivered services, in other words, services that are automated and delivered over a network and/or the Internet from a third party datacenter. These include hosting services, managed services and cloud services. In order to be effective, these services also require a robust, quality, secure and cost-effective network infrastructure to support their delivery. The next phase of this will entail delivering network services over the cloud. IDC believes that networking-as-a-service will increasingly grow in popularity as IT organizations evolve into an "everything-as-a-service" model.

Total Networking Skills Demand and Supply Trends in Turkey, the Middle East, North Africa, and Pakistan

Demand for Networking Skills in Turkey, the Middle East, North Africa, and Pakistan outstrips supply

IDC's research reveals a significant skills gap across the seven countries covered in this study. In 2012, IDC estimated a shortage of 47,945 full time equivalents (FTEs) with networking skills across the seven countries. This number will increase to 129,862 by 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 26.2% in 2012 and 39.7% in 2016. The number of skilled people is based on IDC's proprietary skills model which calculates FTEs which are defined as IT professionals spending 100% of their time working with networking technology.

TABLE 1

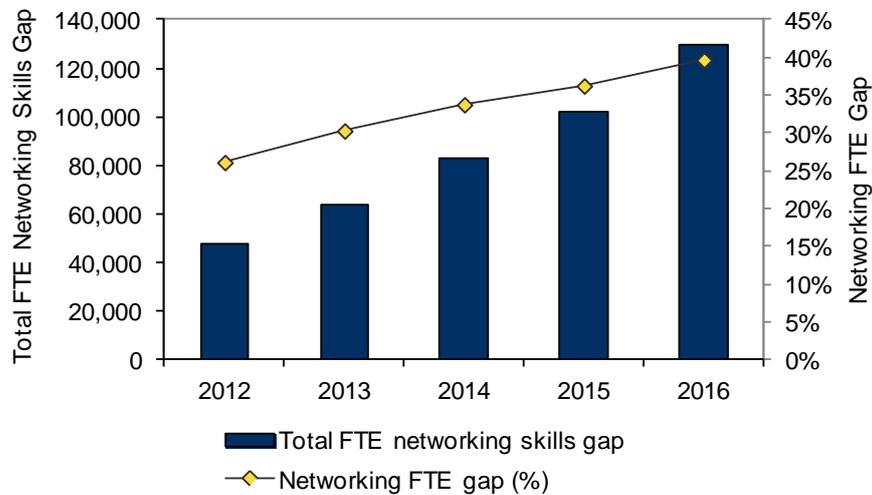
Demand and Supply of Combined Networking Skills in Turk/MENA/Pak, 2012–2016

	2012	2013	2014	2015	2016	2012–2016 CAGR
Demand	183,304	211,616	245,438	281,479	327,141	15.6%
Supply FTE	135,359	147,439	162,498	179,371	197,279	9.9%
Gap FTE	47,945	64,177	82,940	102,108	129,862	28.3%
Gap % FTE	26%	30%	34%	36%	40%	N/A
Skilled People Gap	67,124	89,847	116,116	142,951	181,807	28.3%

Source: IDC, 2013

FIGURE 3

Total Networking Skills Demand and Supply Trends in Turk/MENA/Pak, 2012–2016



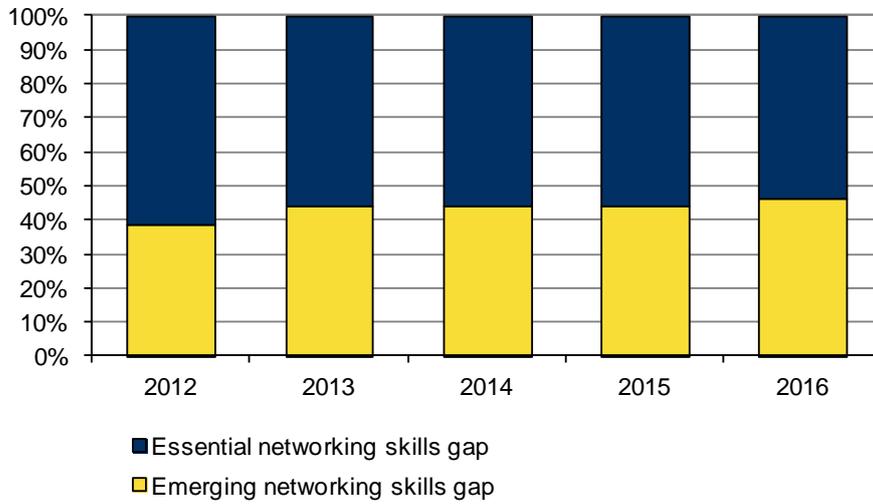
Source: IDC, 2013

Increasing Demand for New Networking Skills Exacerbating the Skills Gap in Turkey, the Middle East, North Africa, and Pakistan

The IT industry is a dynamic and fast-changing environment, with new technologies and solutions being constantly introduced. This puts strain on the management of technical resources; managers regularly need to re-skill, retrain, and rehire technical human resources to keep up with this technological change. In fact, in many countries of the region, the adoption of new technologies often lags behind adoption in more mature markets because due to a lack of skills in the market to design, implement, and manage these newer technologies. For example, the adoption of virtualization technologies in Turkey, the Middle East, North Africa, and Pakistan was initially quite limited, not because there was no demand, but simply because availability of virtualization skills was severely constrained at first. The skills required for these emerging technologies play a significant role in terms of contribution to the total networking skills gap, which, by 2016, will amount to 45.6%.

FIGURE 4

Contribution of Emerging and Essential Networking Skills to Total Networking Skills in Turk/MENA/Pak, 2012–2016

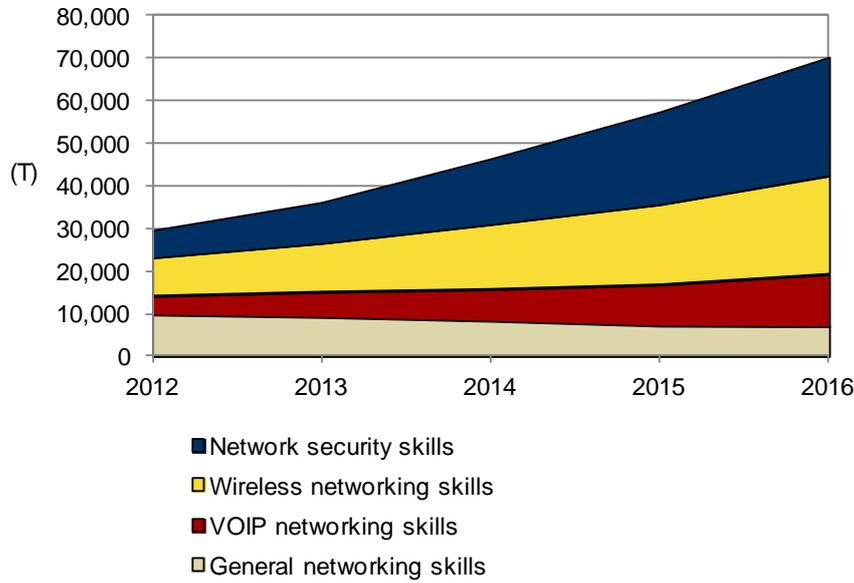


Source: IDC, 2013

Essential networking skills include skills around existing and well-established networking technologies, including routing and switching, wireless, VoIP, and network security. Even though these technologies are well established, a skills gap still exists – particularly in the areas in which more sophisticated skills are required, such as wireless and network security. Over time, the gap for general networking skills (routing and switching) will decline, but the gap will increase for VoIP, wireless, and network security.

FIGURE 5

Essential Networking Skilled People Gap in Turk/MENA/Pak
2012–2106

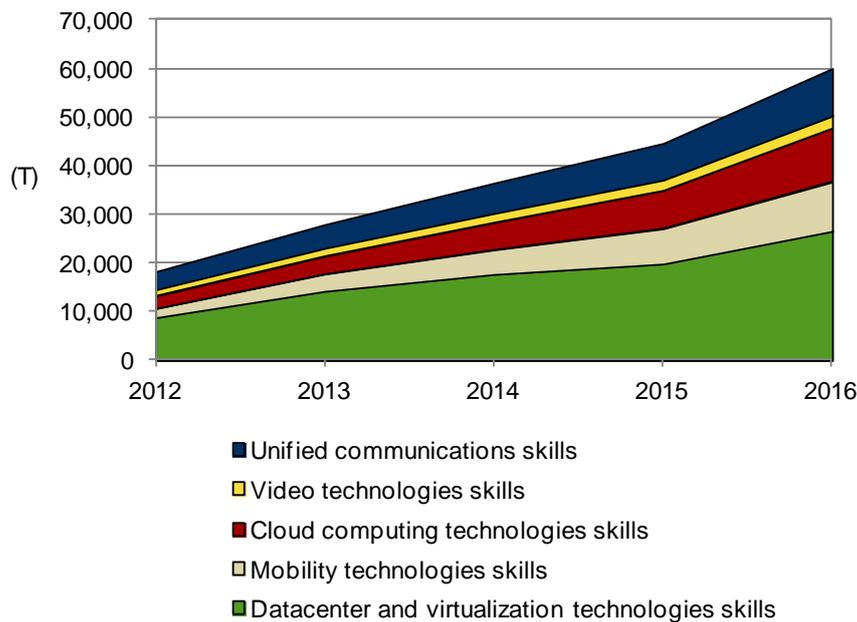


Source: IDC, 2013

As described earlier in the report, the IT industry is currently in a state of transformation, leading to the emergence of transformative technologies, which are significantly changing the face of IT today. At the same time, in the current economic climate, budgets are a lot tighter, and IT leaders are looking at ways to optimize their existing investments – through technologies such as virtualization – as a means to free up capital to invest in some of the more transformative technologies such as mobility. The need also exists for much greater efficiency with the datacenter and increasing pressure to shorten the time taken to deliver new applications, services, and resources to the business.

FIGURE 6

Emerging Networking Skilled People Gap in Turk/MENA/Pak
2012–2106



Source: IDC, 2013

Transformative technologies such as mobility, cloud computing, virtualization, and unified communications offer a lot of advantages in terms of efficiency, productivity, and cost savings, but they also bring new security risks to enterprise environments. In fact, according to the results of IDC's research, most enterprises in Turkey, the Middle East, North Africa, and Pakistan believe that security skills will top the list of their future skills requirements.

The enterprise network and datacenter will continue to be areas of priority and focus for a number of reasons. The amount of data and information processed through the datacenter is growing exponentially. Optimization technologies such as cloud computing and virtualization are highly automated, putting additional strain on datacenter and network resources because they are hosted within the datacenter and delivered over enterprise networks. As convergence accelerates, the complexity of managing a datacenter will increase, putting additional pressure on IT security.

The number of devices connecting to the datacenter is not only increasing, but these devices are also increasingly diverse and coming from multiple sources. Mobility, or the explosion of mobile devices within the enterprise, has had a major impact on enterprise wireless LAN (WLAN) networks. Increasingly, organizations are being forced to implement bring-your-own-device (BYOD) policies. Employees are increasingly looking to use their personal smart phones and tablets for business purposes, and they are demanding flexibility and choice in terms of the types of device they use. Businesses are also looking to adopt mobile applications to communicate both internally and externally. Today's WLANs need to deliver a much higher quality of service (QOS) and to be more flexible, secure, and easy to deploy in order to support new mobility demands.

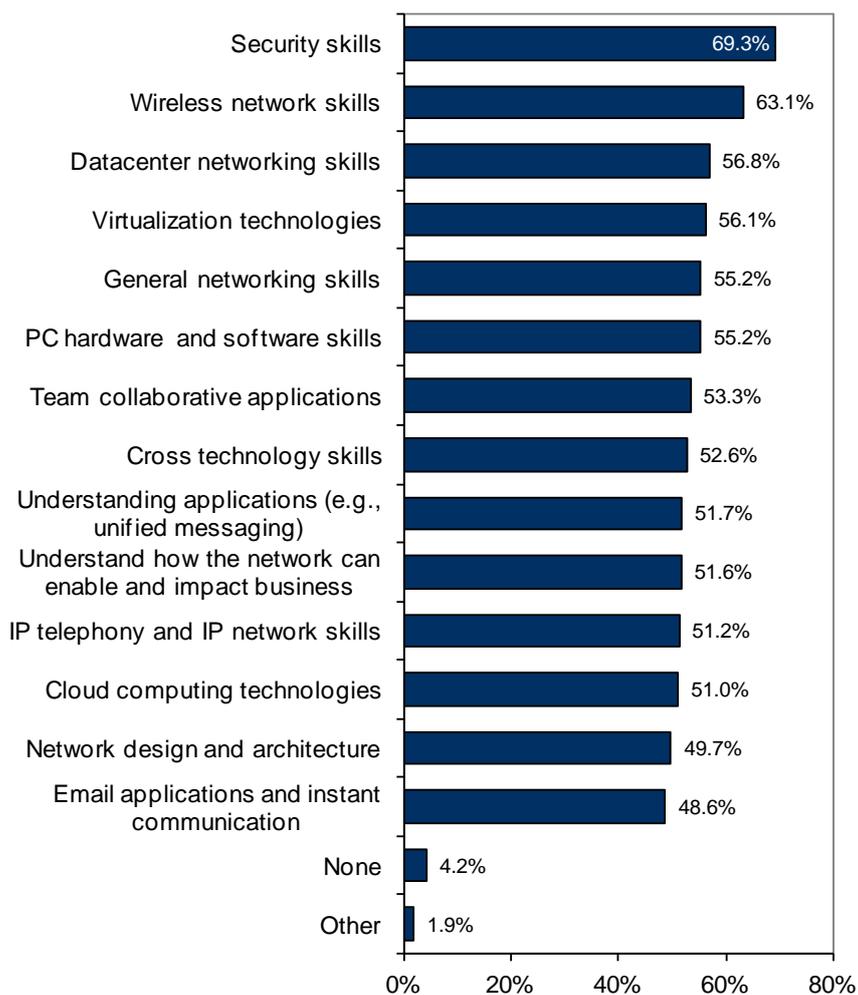
Enterprises are also looking to leverage their networks to integrate communications technologies into their networked environments. In order to leverage video, voice, and

other communications technologies more efficiently, many enterprises are looking to adopt unified communications (UC) solutions, which unify a plethora of previously siloed communications tools. These technologies, particularly video, add additional strain on enterprise networks. In fact, security, wireless LAN, datacenter networking, and virtualization skills are seen as the areas in which new or extra skills will be required to fill demand over the next 12–24 months.

FIGURE 7

New Skills Needed in the Next 12–24 Months

Are you expecting to need new or extra skills in the following areas in the next 12 to 24 months?



N = 574

Source: IDC, 2013

The essential technologies skills gap will grow at a CAGR of 24% between 2012 and 2016, and the emerging technologies skills gap will expand at a CAGR of 34.4% over the same period. As more and more elements are added to the network, specialization in essential networking technologies will become more crucial. The demand for networking skills in emerging technologies will be driven by the need to optimize, converge, unify, integrate, and, importantly, secure enterprise IT

environments while embracing some of the newer transformative technologies that are emerging today.

Networking Skills Assessment

As pressure on the network grows and the importance of the network increases, the need for skilled networking professionals also increases. The region covered already faces a significant challenge in terms of access to skilled IT professionals, and this is only set to increase over the forecast period, exacerbated by the pace of technological change. IDC believes it will become increasingly challenging to attract, retain, and train skilled networking professionals.

IDC's survey across the seven countries profiled in this report found the following:

- ☒ Some 51% of respondents believe the proportion of their investments in network products and infrastructure will increase relative to their total IT budget in the next 12-24 months.
- ☒ Some 33% of respondents have increased the number of people with networking skills in their organizations over the past 12 months.
- ☒ Some 40% of organizations find it difficult to find networking professionals with the right skills.
- ☒ Security skills are the most in demand, with 69% of respondents expecting to need new or extra skills in this domain over the next 12–24 months.
- ☒ A very high value is placed on professional certifications in Turkey, the Middle East, North Africa, and Pakistan, with 69% of respondents believing that professional certifications are an important consideration when hiring and 57% believing that professional certifications will become more important to their organizations in the future.
- ☒ The majority of respondents also believe that the value of certifications will increase if sponsored by technology vendors; 49.3% ranked this as the most important element in terms of increasing the value of certifications, with government recognition being the second most highly rated element, at 31.4%.

FUTURE OUTLOOK

The importance of IT to organizations in Turkey, the Middle East, North Africa, and Pakistan is growing. IT is increasingly being perceived as a business differentiator and facilitator. The network is core to this, and most organizations across the seven countries covered see the network as a critical business tool. More specifically:

- ☒ In the seven countries surveyed, 96% of respondents believe their network will become more important in the future.
- ☒ Some 62% believe the network is a key platform for sharing processes with key partners, suppliers, and customers, and 51% see it as a collaborative platform enabling interaction using specific applications that combine mobile, video, applications, and other tools.
- ☒ Employees in 66% of the companies interviewed use the network as a means to remotely access enterprise systems.

In addition to this, emerging technologies such as cloud, unified communications, video, virtualization, and mobility are increasing the importance of IT within all organizations. The network underpins IT and has become the backbone supporting

organizations in Turkey, the Middle East, North Africa, and Pakistan, and so investments in network infrastructure are set to continue.

Emerging technologies will naturally show the most growth, which is directly impacting demand for skills in these domains. Demand for mobility technology skills will expand the most, at a CAGR of 52.2% through 2016. Demand for cloud computing skills will be the second fastest growing requirement area, expanding at a CAGR of 44% in 2012–2016, followed closely by demand for network security skills, expanding at a CAGR of 43.9%.

TOTAL NETWORKING SKILLS SHORTAGE

In order to provide further insight into the existing and future requirements for networking professionals across the region covered, IDC used a skills model to quantify demand and supply and the subsequent gap. The definition of networking skills includes all people needed to plan, design, manage, and maintain networking technologies and infrastructure within an organization.

IDC also used the concept of FTEs to allow direct comparison between countries and sectors. FTEs are staff members who spend 100% of their work time on networking-related activities. Because research has shown that, on average, networking professionals spend 60% of their time working on networking tasks in the region, the IDC model also uses the concept of skilled people in its model. Skilled people includes all the people with formal training and certifications in essential and emerging technologies to plan, design, manage, and maintain networking technologies and infrastructure within an organization.

As shown in Table 2, IDC estimated that demand for networking skills in organizations in the seven countries covered reached 183,304 FTEs in 2012. This number represents the total amount of work that needs to be done in the networking space and the number of people that need to be assigned to the tasks involved, assuming that they all spend 100% of their available work time on networking.

The total of professionals estimated for the countries analyzed includes those for essential and emerging technologies. Considering these technologies, an undersupply of around 47,945 FTEs in 2012 represented a shortage of skilled people of around 26.2% that year – a figure that will increase to 129,862 in 2016. In percentage terms, IDC estimates that the total networking skills gap in the seven countries will increase 13.5 percentage points to reach 39.7% in 2016.

TABLE 2

Demand and Supply of Combined Networking Skills in Turk/MENA/Pak by Country, 2012 and 2016

	2012		2016	
	Full Time Equivalent Gap	Gap %	Full Time Equivalent Gap	Gap %
Saudi Arabia	17,736	73.0%	33,792	79.4%
United Arab Emirates	5,242	31.8%	15,386	47.8%
Jordan	497	22.2%	1,367	34.4%

TABLE 2

Demand and Supply of Combined Networking Skills in Turk/MENA/Pak by Country, 2012 and 2016

	2012		2016	
Morocco	1,536	27.0%	2,869	31.2%
Egypt	10,465	20.2%	32,867	35.0%
Turkey	10,321	17.0%	37,221	35.0%
Pakistan	2,147	9.6%	6,359	16.2%

Source: IDC, 2013

Another way to look at the gaps in networking skills is to examine how the sizes of the forecast percentage gaps for each country compare with one another. Such an examination provides interesting country rankings (see Table 3). While the position of each country in the table is indicative of the situation faced when it comes to skills shortfalls as a proportion of total demand in each country, it is also important to examine how the magnitude of the gaps (skilled people estimates) relate to the relative sizes of the technology markets that exist in each of these countries. This provides a clear picture of the challenges ahead.

TABLE 3

Demand and Supply of Essential Networking Skills in Turk/MENA/Pak 2012–2016

	2012	2013	2014	2015	2016	2012–2016 CAGR
Demand	129,052	140,299	157,743	176,403	195,341	10.9%
Supply FTE	99,527	104,208	111,404	119,053	125,622	6.0%
Gap FTE	29,525	36,091	46,339	57,351	69,718	24.0%
Gap % FTE	23%	26%	29%	33%	36%	N/A
Skilled People Gap	41,335	50,527	64,874	80,291	97,606	24.0%

Source: IDC, 2013

Saudi Arabia has the highest overall networking skills gap in both percentage terms and absolute terms in 2012. Historically, oil rich Saudi Arabia's education system placed little emphasis on technical and engineering disciplines. Although this is now changing, there is still a very small pool of technically qualified Saudi Arabian nationals. This leads many organizations to rely on a transient expatriate IT workforce. However, visa regulations are fairly prohibitive in Saudi Arabia, and the government has strict policies and quotas in terms of the numbers of Saudi nationals

(Saudization) employed by any organization, making this reliance on expatriates increasingly difficult. At the same time, the government has been actively investing in massive infrastructure and in a number of significant initiatives to encourage investment and economic diversification away from a dependency on oil, and these investments are driving demand for IT technologies. This combination of rapidly increasing demand for technology and a severely limited supply of domestic IT professionals is a challenge facing most organizations in the kingdom. While many overcome this challenge by using fly-in or contracted expatriate workers, this is neither a long-term nor a sustainable solution to addressing these gaps effectively. The government is thus actively investing in education and skills development programs to try not only to bridge these gaps but also to try to decrease unemployment in the kingdom.

The United Arab Emirates (UAE) had the second highest overall networking skills gap in percentage terms in 2012 but not in absolute terms. Significantly, in 2016, it will have a much higher gap in percentage terms (51.1%), which will primarily be driven by demand for emerging networking skills. Like Saudi Arabia, the UAE has a very high dependency on an expatriate workforce, but it has created a very business-friendly climate to attract talent and a sustainable and growing pool of skilled expatriate workers. Additionally, the UAE acts as a hub for the broader Middle East region, with many multinational IT organizations using the country as their headquarters for the Middle East or even the Middle East and Africa. This dynamic means that skills, particularly advanced technical skills, are more readily available than in some other Middle Eastern countries. The United Arab Emirates is also one of the more mature in terms of technology adoption in the region, which is one of the reasons for the high growth in terms of demand for emerging technology solutions.

Jordan, although a small country, has a fairly established IT community, and many Jordanian IT firms outsource their technical skills to other countries in the Middle East. It has the smallest gap in absolute terms, with a skills gap of just 497 FTEs in 2012.

Morocco has the third highest skills gap in percentage terms (27%), and it will grow to 31.2% in 2016. Most of this growth will come from demand for emerging networking skills. The Moroccan government has a number of initiatives to encourage not only the usage of ICT in Morocco but also to build up Morocco as an offshore hub to support Francophone countries. ICT forms a key component of this offshore industry, and the government is likely to continue investing in initiatives to encourage ICT skills development in Morocco to support the demand from its growing offshore industry.

Egypt, like Jordan, has a very established domestic IT community, and many Egyptian IT firms outsource their technical skills to other countries in the Middle East. However, most of these skills lie within essential networking technologies, with only an 11.7% gap in 2012. The gap for emerging networking skills is considerably higher, at 36% in 2012, and it will grow to 49.2% in 2016. The Egyptian government has also actively encouraged the development of ICT skills through a number of initiatives, primarily driven by the Ministry of Communications and Information Technology (MCIT) through its executive IT arm, the Information Technology Industry Development Agency (ITIDA). ITIDA has launched a number of initiatives to develop skills, attract foreign investment, encourage the growth of Egypt's outsourcing and offshoring industries, and help Egyptian IT companies develop business opportunities outside of Egypt. Although Egypt has faced significant political turmoil since the Arab Spring, in 2011, bodies like ITIDA remain active.

Turkey has the second lowest skills gap in 2012 in percentage terms (17%) but the third highest in absolute terms (10,321 FTEs) due to the size of the Turkish

population. In comparison with most of the other countries profiled in this study, Turkey has a relatively mature ICT sector and a well-established IT community. However, Turkey needs to address its networking skills gap, as this gap will grow to 35% and 37,221 FTEs in 2016. Turkey has a large, young, and educated population but faces a challenge in terms of attracting or encouraging students to enter into engineering and technology disciplines, as many students believe opportunities and pay are better in other sectors.

Pakistan had the lowest skills gap in 2012 in percentage terms (9.6%) and the second lowest in absolute terms (2,147). This gap is set to grow to 16.2% and to represent 6,359 FTEs in 2016. This relatively lesser gap is due to a number of reasons. First, Pakistan has the largest population of the countries included in this study, so the pool of resources is that much greater. It is also a country that places high value on technology, science, and engineering, which encourages young Pakistanis to pursue careers in these fields. Demand for networking technologies, particularly essential networking skills, is also relatively low; it will expand at a CAGR of 10.8% over the forecast period, which has also contributed to the relatively small skills gap. One of the challenges Pakistan does face, however, is that many of its skilled IT and engineering graduates pursue opportunities in other countries, particularly in the Middle East, and so retaining talent to support domestic demand can be an issue.

Demand for Essential Technology Skills

The research conducted by IDC in the seven countries covered in the report shows strong demand for essential technology skills across all countries, sectors, and end-user segments analyzed.

According to the IDC networking skills model, IDC estimates that the demand for essential networking skills amounted to 129,052 FTE's in 2012, with a supply of only 99,527, resulting in a gap of 22.9%. Through 2016, demand for these skills will expand at a CAGR of 10.9%, with a CAGR for supply of only 6.0%, resulting in a skills gap of 35.7% and 69,718 FTEs.

TABLE 4

Demand and Supply of Essential Networking Skills in Turk/MENA/Pak by Country, 2012 and 2016

	2012		2016	
	Full-Time Equivalent Gap	Gap %	Full-Time Equivalent Gap	Gap %
Saudi Arabia	12,665	74.1%	20,023	78.8%
United Arab Emirates	3,750	32.8%	8,344	45.3%
Jordan	325	19.6%	690	27.9%
Morocco	1,108	25.8%	1,763	28.8%
Egypt	3,927	11.7%	10,625	21.9%
Turkey	6,999	15.2%	25,499	35.6%
Pakistan	751	5.0%	2,774	12.2%

TABLE 4

Demand and Supply of Essential Networking Skills in Turk/MENA/Pak by Country, 2012 and 2016

	2012	2016
--	------	------

Source: IDC, 2013

Looking at the specific essential skills in demand, wireless tops the list, with 39.5% of a skills gap in 2012 and 54.7% forecast for 2016. The gap in network security skills will show the most growth, expanding at a CAGR of 43.9% from 19.5% and 6,503 FTEs in 2012 to 46.8% and 27,868 FTEs in 2016. VOIP networking skills were also found to be in short supply in the region. A gap of 4,359 FTEs (31.9%) is forecast to grow to 12,309 FTEs (46.4%) in 2016. Implementation of VoIP solutions has been somewhat hindered in the region by regulatory policies that ban its usage (e.g., in the UAE) and poor and/or expensive telecommunications services, but demand for VoIP is expected to grow, which will further broaden the skills gap. General networking skills (switching and routing) will be the most readily available in the region, with a skills gap of 16.5% and 9,852 FTEs in 2012 lessening to 10.5% and 7,070 FTEs in 2016.

TABLE 5

Demand and Supply of Emerging Networking Skills in Turk/MENA/Pak 2012–2016

	2012	2013	2014	2015	2016	2012–2016 CAGR
Demand	54,253	71,317	87,695	105,075	131,800	24.8%
Supply FTE	35,832	43,232	51,094	60,318	71,657	18.9%
Gap FTE	18,421	28,086	36,601	44,757	60,144	34.4%
Gap % FTE	34%	39%	42%	43%	46%	N/A
Skilled People Gap	25,789	39,320	51,241	62,660	84,201	34.4%

Source: IDC, 2013

Demand for Emerging Technologies Skills

The growing demand for skills around emerging technologies – datacenter and virtualization, unified communications, video, cloud computing, and mobility – is having a significant impact on the networking skills gap in Turkey, the Middle East, North Africa, and Pakistan. Emerging technology skills currently represent 38% of the total skills gap growing to 44% in 2016.

According to IDC's model, the gap for emerging networking skills reached 18,421 FTEs in 2012 and will reach 60,144 in 2016.

TABLE 6

Demand and Supply of Emerging Networking Skills in Turk/MENA/Pak by Country, 2012 and 2016

	2012		2016	
	Full-Time Equivalent Gap	Gap %	Full-Time Equivalent Gap	Gap %
Saudi Arabia	5,071	70.4%	13,769	80.3%
United Arab Emirates	3,750	32.8%	8,344	45.3%
Jordan	173	29.9%	677	45.1%
Morocco	428	30.4%	1,106	35.8%
Egypt	6,538	36.0%	22,242	49.2%
Turkey	3,323	22.6%	11,722	33.8%
Pakistan	1,396	19.5%	3,585	21.9%

Source: IDC, 2013

Given the rapid rise of mobile penetration in most of the countries analyzed in this paper, it is unsurprising that demand for mobility technology skills is forecast to show the strongest growth – from a gap of 1,890 FTEs (19.1%) in 2012 to 10,154 FTEs (40.9%) in 2016. The biggest gap (in absolute terms) exists in datacenter and virtualization technology skills – a gap of 8,956 FTE's (45%) in 2012 growing to 26,737 (52.6%) in 2016. The recent accelerated adoption of virtualization technologies in the region is driving up this demand, and the shortage of qualified technical human resources with such skills will be a major challenge for organizations in the region.

Likewise, cloud computing skills are will be a major challenge, and the adoption of these technologies may be inhibited by a major shortage of skills. In 2012, a gap of 33.7% (2,511 FTEs) existed for cloud computing technology skills; this is set to widen to 48.6% (10,814 FTEs) in 2016.

Unified communications and video technology skills are also in short supply. In 2012, the region experienced a shortage of 3,736 FTEs (31.3%) for UC and 1,327 FTEs (26.3%) for video. The UC gap is expected to expand significantly, reaching 9,769 FTEs (41.3%) in 2016. The gap for video will be less severe, growing to 2,668 FTEs (26.2%) in 2016.

Country Analysis

Saudi Arabia

The key findings of IDC's research into the networking skills gap in Saudi Arabia include the following:

- ☑ A very high value is placed on the importance of the network in Saudi Arabia, with 96% of respondents believing the network will become more important to them in the future and 66% expecting the proportion of investments into network

products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.

- ☒ Some 52% of Saudi organizations have hired networking professionals in the last 12 months, and 38.5% found it difficult to find networking professionals with the right kinds of skill.
- ☒ An astonishingly high 85.9% of respondents will be looking to hire new networking professionals in the next 12 months, with 62.4% hoping to hire two or more networking professionals.
- ☒ As mentioned earlier, organizations in Saudi Arabia rely very heavily on an expatriate IT workforce, and communication skills were rated as the most important non-technical skill needed in Saudi Arabia (66%). Finding technical skills with the ability to understand and communicate in English was cited as the most significant challenge facing those who found hiring networking professionals a challenge.
- ☒ Professional certifications are given high importance in Saudi Arabia, with 90% of respondents believing these to be important when hiring networking professionals.

Of all the countries profiled in this study, Saudi Arabia faces the most severe skills challenge, with a 73% total networking skills gap in 2012. The lack of technically qualified Saudi nationals means that Saudi organizations have to rely on an expatriate and often temporary (fly-in) IT workforce. At the same time, Saudi Arabia has very strict visa regulations and a strong nationalization agenda, which further exacerbate the challenge of accessing skilled networking professionals.

The Saudi Arabian government acknowledges these challenges, and significant amounts of investment and effort have gone into not only improving IT literacy in the country but also encouraging investment in ICT and development of skills. The development of the King Abdullah University of Science and Technology (KAUST) is testament to this commitment. Founded in 2009, this large university focuses exclusively on graduate education and research; using English as the official language of instruction, it offers courses focused exclusively within the science, technology, and engineering fields.

The government is also actively encouraging investments in ICT and the development of the ICT industry through its Communications and Information Technologies Commission (CITC). CITC is mandated to act as the country's telecommunications regulator but also to act as an industry development agency mandated to grow the ICT industry through various initiatives and programs.

The Saudi economy is a growing economy, with a real GDP growth forecast of 4.1% in 2013. The government is investing massively in infrastructure, healthcare, education, citizen-centric services, and more. These investments are driving investments in IT technologies, with the Saudi Arabian IT market forecast to grow at a CAGR of 9.2% during 2012–2016. The growth in the IT market will fuel demand for technical resources, which will have a very direct impact on the networking skills shortages facing the country. These gaps are likely to be supplemented by contracted fly-in resources provided by third-party providers of IT services.

According to our IDC model, we estimate a shortage of approximately 17,736 professional networking FTEs in 2012. This number will increase to 33,792 FTEs in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 73% in 2012 and 79.4% in 2016.

The United Arab Emirates

The key findings of IDC's research into the networking skills gap in the United Arab Emirates (UAE) include the following:

- ☒ In line with the findings from Saudi Arabia, 98.1% of UAE respondents believe the network will become more important to them in the future, with 55.2% expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ Among the companies interviewed, 41.3% are looking to hire new networking professionals in the next 12 months, with 27.2% looking to hire two or more networking professionals.
- ☒ In the last 12 months, 25.7% of UAE organizations have hired networking professionals, and 40.7% found it difficult to find networking professionals with the right kinds of skill.
- ☒ Like Saudi entities, UAE organizations rely very heavily on an expatriate IT workforce, and communication skills were also rated as the most important non-technical skill needed in the country (80%).
- ☒ Testament to the relative maturity of the UAE market in comparison with Saudi Arabia is the much higher value placed on problem-solving abilities, with 75.2% of respondents citing this as an important non-technical skill needed in addition to technology skills.
- ☒ Although less so than is the case in Saudi Arabia, professional certifications are also given high importance in the UAE, with 61% of respondents believing them to be important when hiring networking professionals.

The United Arab Emirates has created a business and culturally tolerant environment designed to attract and retain a growing pool of expatriate skills. While the UAE government also has a strong nationalization agenda (Emiratization), it is less restrictive than the agenda in Saudi Arabia.

The UAE faces a significant skills challenge, with a 31.8% total networking skills gap in 2012. However, it must be noted that its ability to attract, retain, and grow a skilled expatriate workforce enables it to respond quite quickly to these skills gaps.

The United Arab Emirates has already done a lot to attract multinational IT companies to invest in the country. The establishment of Dubai Internet City in the early 2000s is a testament to this, and now most global IT organizations have their Middle Eastern headquarters in Dubai. The government has also been very successful in terms of attracting foreign investment, and the country acts as a hub for many multinational organizations across many sectors. These initiatives have resulted in the UAE having a more mature ICT environment than many of its counterparts in the region.

Although the UAE, particularly Dubai, was significantly impacted by the global economic recession, the economy is recovering, with GDP expected to grow 3.7% in 2013. The UAE IT market will expand at a CAGR of 7.4% during 2012–2016.

Based on our IDC model, we estimate a shortage of approximately 5,242 professional networking FTEs in 2012. This number will increase to 15,386 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 31.8% in 2012 and 47.8% in 2016.

Jordan

The key findings of IDC's research into the networking skills gap in Jordan include the following:

- ☒ Some 96% of Jordanian respondents believe the network will become more important to them in the future, with 62% expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ Demand for networking professionals in Jordan is strong; 60% of respondents indicated they had hired networking professionals in the last year, with 82.9% of respondents looking to hire new networking professionals in the next 12 months, with 60.9% looking to hire two or more.
- ☒ Some 30% of Jordanian respondents indicated that finding these networking professionals was difficult, with almost 45% stating that finding technically qualified candidates with English language skills was the primary challenge.
- ☒ Some 28% of Jordanian organizations believe that professional certifications are very important when hiring networking professionals, with 68% believing them to be important and 88% believing certification will become more important in the future.

Jordan has a young and well-educated population with a good pool of technically skilled resources, the result of significant education reforms in the 1990s. This reform process was accelerated with the government's vision to make Jordan a regional technology hub. The government continues to drive growth in the ICT industry under the banner of the National ICT Strategy and through the Information and Communications Technology Association – Jordan (Intaj).

The Jordanian economy is growing, with GDP expected to increase by around 3% in 2013. Its IT market is expected to expand at a CAGR of 9.1% through 2016.

According to our IDC model, we estimate a shortage of only 497 professional networking FTEs in 2012. This number will increase to 1,367 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 22.2% in 2012 and 34.4% in 2016.

Morocco

The key findings of IDC's research into the networking skills gap in Morocco include the following:

- ☒ Some 96% of Moroccan respondents believe the network will become more important to them in the future, with 60% expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ Demand for networking professionals in Morocco is less aggressive than in other countries, with only 30% of respondents indicating they had hired networking professionals in the last year and only 36.2% of respondents looking to hire new networking professionals in the next 12 months.
- ☒ Out of the seven countries, Morocco appears to face the least challenge in terms of finding networking professionals with the right skills, with only 26.7% indicating that it was difficult to do so.
- ☒ Some 60% of Moroccan organizations believe professional certifications to be important, and 70% believe certification will become more important in the future.

The Moroccan government has a number of initiatives to encourage not only the usage of ICT in Morocco but also to build up Morocco as an offshore hub to support Francophone countries. ICT forms a key component of this offshore industry, and the government is likely to continue investing in initiatives to encourage ICT skills

development in Morocco to support the demand from its growing offshore industry. It also has an aggressive e-government agenda, which is further fueling the adoption of IT in Morocco.

The Moroccan economy, given its close link with Western Europe, has been impacted by some of the economic challenges besetting Europe. But it is recovering, with GDP expected to grow 3.3% in 2013. Its IT market will expand at a CAGR of 5.9% during 2012–2016.

According to our IDC model, we estimate a shortage of 1,536 professional networking FTEs in 2012. This number will increase to 2,869 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 27% in 2012 and 31.2% in 2016.

Egypt

The key findings of IDC's research into the networking skills gap in Egypt include the following:

- ☒ Nearly all Egyptian respondents (98%) believe the network will become more important to them in the future, but, given the current economic and political climate in Egypt, only some 50% are expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ In the next 12 months, 51.2% of respondents are looking to hire new networking professionals, and 36% have already hired these skills in the last 12 months.
- ☒ Some 39% of respondents in the country indicated that it was difficult to find networking professionals with the right skill sets.
- ☒ Professional certifications are also not seen as critical in comparison with other countries, with only 56% of Egyptian organizations believing professional certifications to be important and 66% believing certification will become more important in the future.

Egypt, like Jordan, has a very established domestic IT community, and many Egyptian IT firms outsource their technical skills to other countries in the Middle East.

Like the government in Morocco, the Egyptian government has a number of initiatives to encourage not only the use of ICT in the country to also build the Egyptian ICT industry and to continue to improve the viability of Egypt as an offshore hub. The government has already invested in a number of programs, initiatives, and incentives to attract foreign investment and encourage the development of its offshore industry. These programs have been driven by MCIT through its executive IT arm, ITIDA. Egypt shows great potential in this regard, but the current economic and political climate in Egypt is likely to have slowed the growth and development of this industry.

The Egyptian economy has been hard hit by the political turbulence that it experienced from 2010 onward during the Arab Spring. GDP is expected to grow 2.9% in 2013. Its IT market will expand at a CAGR of 9.8% during 2012–2016.

According to our IDC model, we estimate a shortage of 10,465 professional networking FTEs in 2012. This number will increase to 32,867 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 20.2% in 2012 and 35% in 2016.

Turkey

The key findings of IDC's research into the networking skills gap in Turkey include the following:

- ☒ Some 92% of Turkish respondents believe the network will become more important to them in the future, and 58% are expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ Demand for networking professionals is currently high, with 100% of respondents looking to hire new networking professionals in the next 12 months; this very high demand is likely the result of delayed hiring due to the current economic climate in Europe, as only 14.3% have hired these skills in the last year.
- ☒ Surprisingly, out of the seven countries covered, Turkey faced the most challenges in terms of finding networking professionals with the right skill sets, with 76.5% stating that it was not easy to find these skills.
- ☒ Professional certifications are seen as important in Turkey but not as critical as in the other countries, with only 60.5% of Turkish organizations believing professional certifications to be important and 61.4% believing they will become more important in the future.

In comparison with most of the other countries profiled in this study, Turkey has a relatively mature ICT sector and well-established IT community. Turkey has a large, young, and educated population but faces a challenge in terms of attracting or encouraging students to enter into engineering and technology disciplines, as they believe better paying job or opportunities can be found in other sectors.

The outlook for the Turkish economy is good, with GDP expected to grow 3.9% in 2013. The country's IT market will expand at a CAGR of 8% during 2012–2016.

According to our IDC model, we estimate a shortage of 10,321 professional networking FTEs in 2012. This number will increase to 37,221 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 17% in 2012 and 35% in 2016.

Pakistan

The key findings of IDC's research into the networking skills gap in Pakistan include the following:

- ☒ The network is given exceptionally high importance in Pakistan, with 100% of respondents believing the network will become more important to them in the future and 64% expecting the proportion of investments in network products and infrastructure to increase relative to their total IT budgets in the next 12–24 months.
- ☒ Some 28% of Pakistani organizations have hired networking professionals in the last 12 months, and 35.7% found it difficult to find networking professionals with the right kind of skills.
- ☒ Around 44% of respondents are looking to hire new networking professionals in the next 12 months, with 36.6% looking to hire two or more networking professionals.
- ☒ Problem solving and communication are the two non-technology skills needed in Pakistan, with 88% of respondents identifying them as required in addition to technology skills.
- ☒ Professional certifications are given relatively high importance in Pakistan, with 76% of respondents believing these to be important when hiring networking professionals.

The quality of education and literacy in Pakistan varies greatly. In general, however, the quality of education has declined in recent years. Engineering and technology are popular career choices for educated Pakistanis, and, given the size of the Pakistani population, the resource pool to draw from is large. However, many educated Pakistanis choose to explore more lucrative careers internationally, particularly in the Middle East, leading to a brain drain within the domestic resource pool. The government has a number of initiatives and programs in place to encourage the development of the ICT sector, in light of its vision to transform itself into a knowledge economy. These initiatives, if successful, could bode well for the Pakistani ICT industry, given the size of its population.

Pakistan's GDP is expected to grow 3.4% in 2013 and the IT market to expand at a CAGR of 5.1% by 2016.

According to our IDC model, we estimate a shortage of approximately 2,147 professional networking FTEs in 2012. This number will increase to 6,359 in 2016. These figures represent a skills gap (calculated as a proportion of total demand) of 9.6% in 2012 and 16.2% in 2016.

CHALLENGES/OPPORTUNITIES

The increasing pervasiveness of the Internet, the transition to the third platform, and the emergence of transformative technologies like mobility and cloud computing are all driving up the importance of the role of the network in modern organizations. Organizations are under pressure to become more agile, more innovative, more flexible, and more responsive in light of increasing competition and challenging macroeconomic conditions. This pressure, to be more responsive, combined with ever-changing technological requirements, has impacted demand for more skilled professionals. This is particularly true of emerging technologies that demand new skill sets to enable companies to adjust to a rapidly changing technological landscape.

In the current economic climate, IT leaders are under pressure to do "more with less" and to optimize the use of existing assets and resources. This becomes even more of a challenge in growing and developing economies like those across this region, where organizations have to balance growth requirements carefully against the caution that prevails in the current global economy.

Demand for emerging technologies continues to grow, as they offer efficiency and innovation advantages far superior to those of legacy IT. All of these technologies entail an increased security risk and demand for new types of skill. Given the already significant skills challenges that many organizations face in the region, the adoption of new and emerging technologies could be hindered in the short-term as IT leaders grapple to cope with the pace of change and with the demands on their already constrained resources.

Without careful consideration of future skills requirements, aggressive skills development programs, a focus on engineering, science, and technical education, and knowledge transfer initiatives, many governments across Turkey, the Middle East, North Africa, and Pakistan could find themselves falling behind and not achieving their ICT objectives to support their ambitions to become more globally competitive.

CONCLUSION

Based on the results of IDC's research across these seven countries, IDC has identified a growing gap between demand for skilled networking professionals and the number of professionals that are available domestically and across the region.

Although professional certification is given high importance in most countries in the region, more needs to be done to ensure skills are transferrable to support emerging technology requirements. A focus on developing non-technical skills, particularly communication and problem-solving skills, is also needed to ensure global competitiveness.

Cross-technology skills remain important, but specialized skills in areas such as mobility, security, datacenter-networking, and virtualization are equally important. IT leaders should focus on finding a balance between the demands of both skill sets.

Given the high importance placed on professional certifications in the regions, IT vendors are encouraged to continue to drive professional certification initiatives in these countries. Alignment with tertiary education institutions is also recommended. Given how young the average population is in most of these countries, being able to influence and establish a skills base at a graduate level will pay off in the long term.

Most of the governments in the countries profiled for this report have pro-ICT development strategies in place and run a number of skills and industry development programs. End-user organizations and the IT vendor community should try to engage with government more actively so as to align skills development programs with the broader national agenda.

Creative solutions will also be required to offset the impact of the networking skills gap in the region. International support in the form of outsourcing and offshoring is one area of opportunity for those countries with larger resource pools, as they can support countries facing extreme skills gaps (such as Saudi Arabia). Nevertheless, across the board, more sustainable skills development programs need to be put in place to make ICT an attractive career choice for the young.

APPENDIX

IDC's Proprietary Skills Model

This document describes the methodology behind IDC's skills model, which forms the basis for developing networking skills demand and supply. The document further describes the data sources and official statistics that have been used as input into this model.

During the late 1990s and early 2000s, IDC was commissioned to provide assessments of and to forecast the demand and supply situation for skills in the network technology arena across different regions around the world. This 2012 study aims to update the former analysis and to cover arising technology solutions that were not evaluated in the previous analysis. The networking market is experiencing an important shift, driven mostly by the implementation of collaboration, video, datacenter and virtualization, cloud, and mobility, and the need is real to attract new talent into the market quickly in order to meet the demand.

As important factors and assumptions have changed dramatically since the original model was constructed in the late 1990s, such as lower growth expectations for both country GDP and IT spending overall, a new model has been constructed that reflects these changes, the methodology of which is described below.

Model Methodology

In addition to collecting data through surveys, IDC used its Skills Model to provide quantitative data to assist in developing an accurate picture of existing and future demand for networking professionals.

To ensure the accuracy of the model's outputs and to allow results to be compared across countries, the following criteria were applied:

- ☒ Only statistical information from reputable sources was used. These statistics must have been available in a wide range of countries to ensure consistency.
- ☒ The model must take into account economic developments in each country, based on both historical data and forecasts from IDC trackers: EMEA Quarterly Ethernet Switch and Router Tracker; EMEA Quarterly WLAN Tracker; EMEA Unified Communications; EMEA Quarterly Server Virtualization Tracker; EMEA Quarterly Mobile Phones Tracker; EMEA Quarterly Security Appliances Tracker; EMEA Quarterly PC Tracker; and Worldwide Black Book.
- ☒ The model must take into account enrollment and graduate data for higher education, as these are indicators of current and future potential skills availability.
- ☒ The model must form part of a holistic view of the IT technology and workforce markets to ensure no sub-optimization is included.

As a first principle in developing the model, IDC established 2012 as a baseline year, since several factors are known or at least have high confidence factors attached – for example, GDP in each country, employment/unemployment rates, IT spending, IT services spending on network and security-related services, and network and security-related shipment data.

Forecasts for supply and demand of skills were then developed based on several data points and predictions from IDC and recognized international sources.

Assumptions

As with any forecast and model exercise, several assumptions have to be made, which can usually only be confirmed in retrospect.

Factors that can affect the forecast:

- ☒ A drastic change in economic conditions
- ☒ Sudden technology shifts
- ☒ Government policy changes that support or suppress IT spending (regulatory changes, austerity decrees, nationalization acts, etc.)
- ☒ Improved performance of the IT services sector, which will stimulate demand for skills and boost IT-related education

In spite of the potential influence of these factors, it is IDC's opinion that the model and the underlying assumptions are sound and viable at the time of publication.

Glossary

The definition of **networking skills** used in the model is: people needed to plan, design, manage, and support the networking technologies in the organization. The definition of skills is necessarily broad due to the proliferation of networking technologies in organizations of all sizes. IDC further uses the following two classifications of skills:

- ☒ **Full Time Equivalent (FTEs):** IDC's model is based on assessing the demand and supply of full-time equivalent networking skills, since this provides the most reliable foundation for modeling. Full-time equivalents are defined as spending 100% of their work time working with networking technologies.
- ☒ **Skilled People:** However, it is clear that most people with networking skills do not spend 100% of their work time working with networking technologies. On average, staff with networking skills also performs peripheral tasks, including PC software and hardware installation and desktop support. Consequently, for this study, IDC defines skilled people as people who have, as a part of their job function, involvement in the planning, design, management, and support of networking technologies.
- ☒ **Skilled People Gap:** This is the number of skilled people needed to close the skills gap.
- ☒ **Labor Supply:** Forces relating to the expertise or skills needed to support the market, such as IT/telecommunications engineers, technical support specialists, field engineers, product developers and designers, managers and other professionals, and skilled implementers. At the beginning of some markets, the availability of skilled professionals may be a gating factor – for example, professionals with networking skills in the market for IP communications or data and radio frequency (RF) engineers in the implementation of wireless networks.
- ☒ **CAGR:** Compound annual growth rate or cumulative annual growth rate.
- ☒ **Service Provider:** A company that transports information electronically. This category includes telecommunication service providers (TSP), competitive local exchange carriers (CLEC), long-distance carriers (LDC), Internet service providers (ISP), value added resellers (VAR), local exchange carriers, and mobile service providers.

Copyright Notice

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

Copyright 2013 IDC. Reproduction without written permission is completely forbidden.