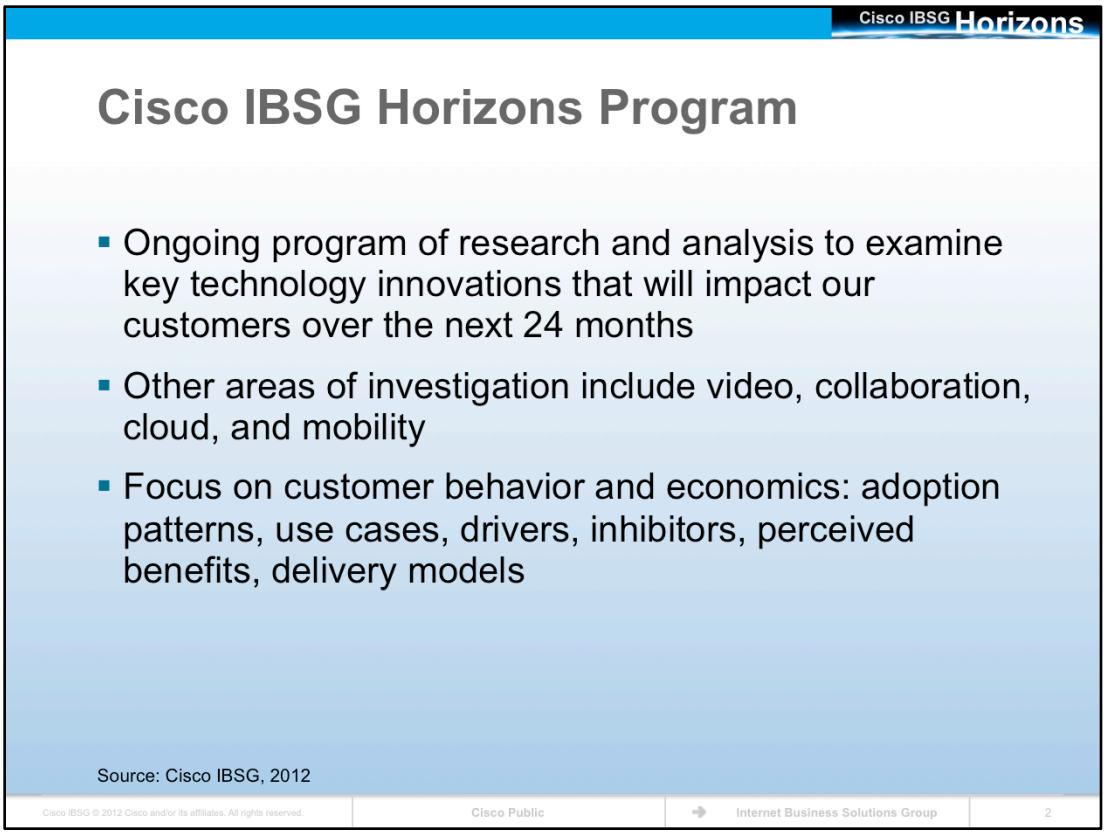
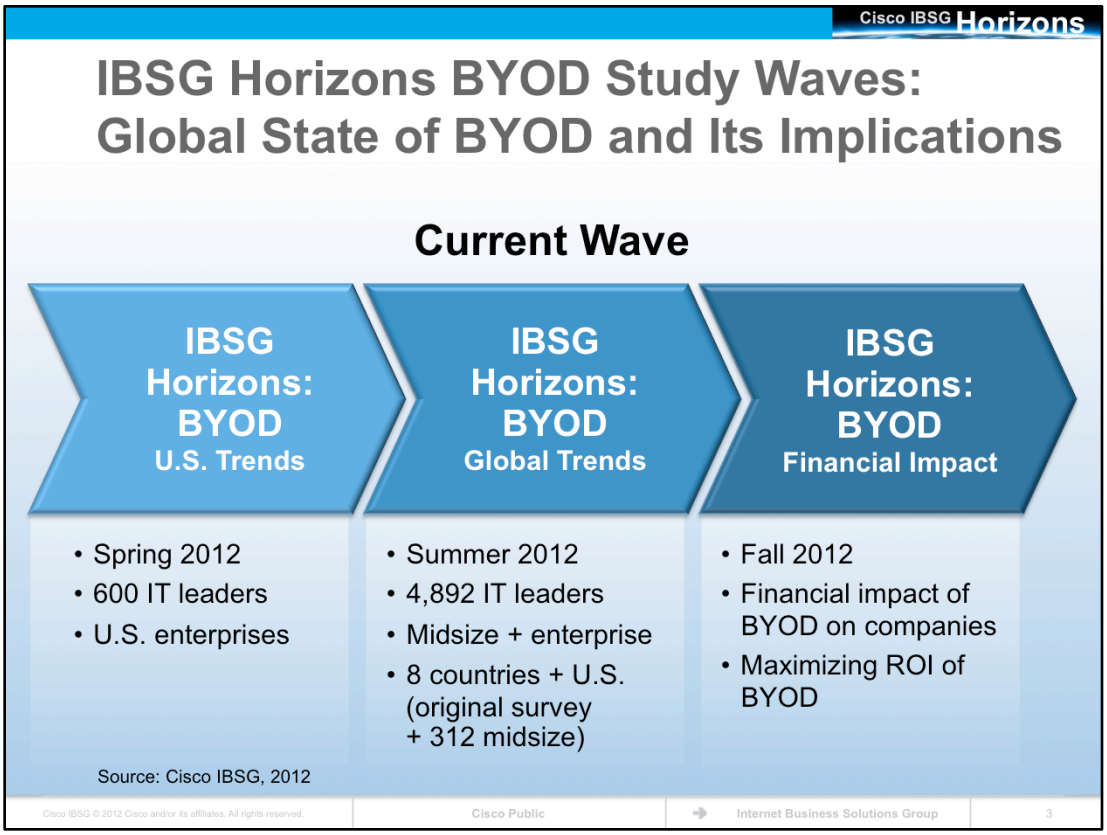
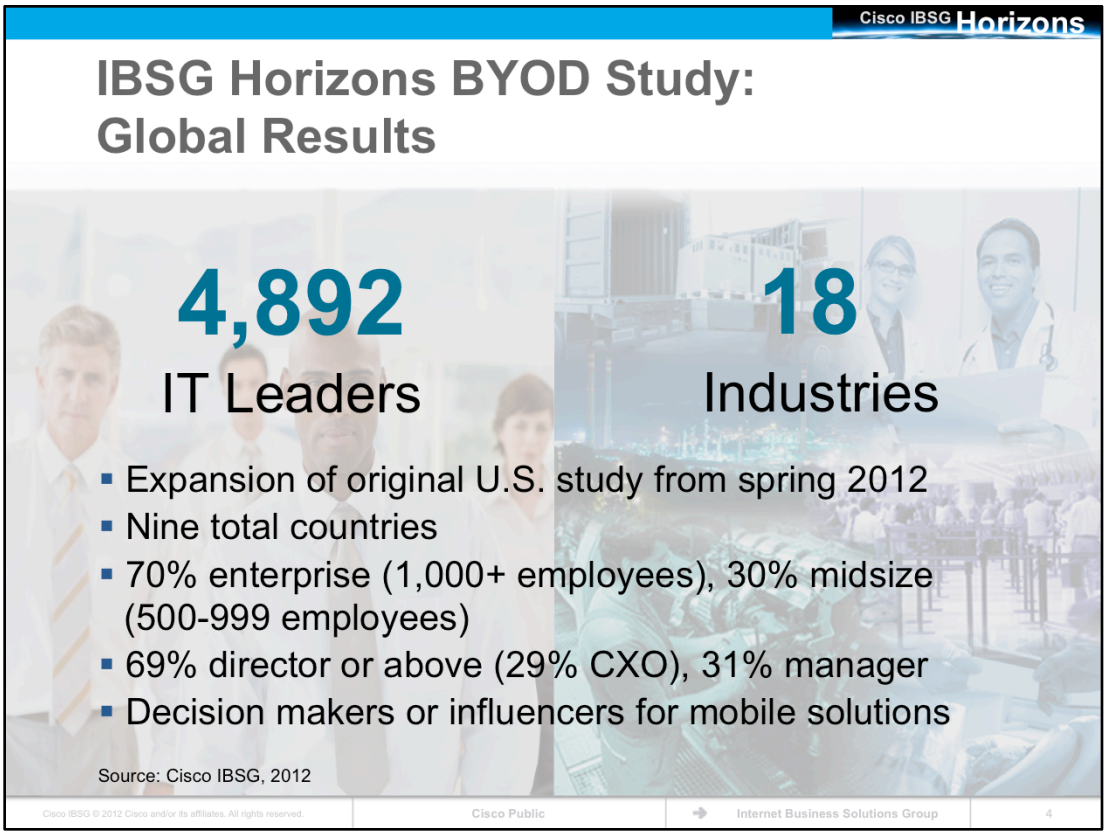
- Companies are now in a post-PC world, where the network must accommodate new choices at every layer of the stack. These include traditional, mobile, and social applications; multiple operating systems; various server architectures; and mobile devices ranging from tablets to smartphones and other mobility tools.
- The Cisco Internet Business Solutions Group (IBSG) has conducted extensive research and analysis to uncover key insights about the various devices entering the network and how companies are dealing with them.
- In this study, we use the term “bring your own device” (BYOD). You will also hear the terms “consumerization” or “consumerization of IT.” BYOD and consumerization both refer to the use of personal mobile devices connected directly or remotely to an enterprise network.
- The study was global in scope, covering nine countries across four continents. This presentation includes the global data, with an emphasis on Brazil.
- The presentation is modular. Please use any of these slides in other presentations, or reorder them to fit your needs.



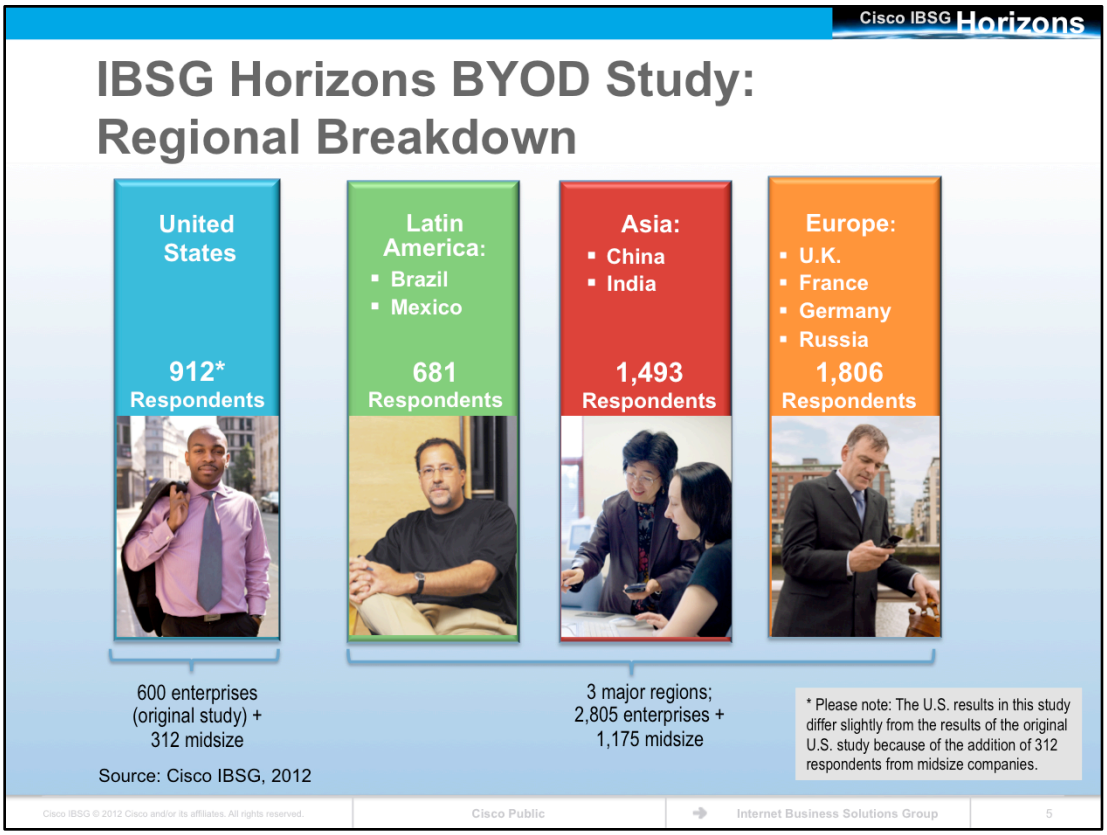
- This study is part of the Cisco IBSG Horizons program, an ongoing research and analysis program designed to identify business transformation opportunities fueled by technology innovation.
- In addition to “bring your own device” (BYOD), we are looking at enterprise video, collaboration, and cloud computing, and examining trends, use cases, adoption patterns, lessons learned, and financial impacts.
- Focusing on the link between a customer’s technology environment and business strategy, the Horizons program accelerates the success of Cisco customers by identifying transformative, network-enabled strategies and analyzing their economic underpinnings.



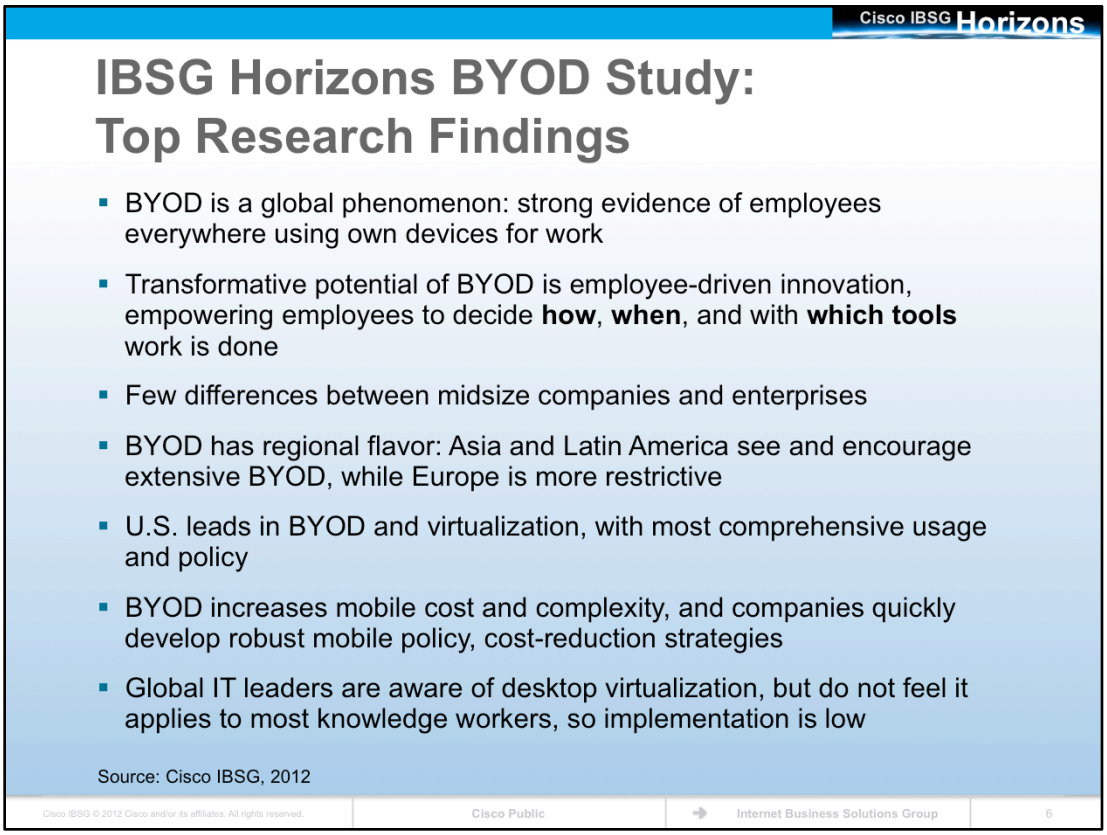
- This study is the second of three planned waves of Cisco IBSG Horizons BYOD research.
- In the spring of 2012, we surveyed 600 IT decision makers in U.S. enterprises to determine how prevalent BYOD is in enterprises, and how corporate IT departments are handling these new devices in terms of support, network access, and security. We also wanted to know whether corporate IT is supportive, indifferent, or hostile toward BYOD.
- When we saw the surprising degree to which U.S. enterprises had embraced BYOD, and their expectations for greater employee productivity and employee-led innovation, we wanted to know whether other countries, as well as smaller companies, were responding in the same way.
- So Cisco IBSG expanded its original study to include IT decision makers in both enterprises (1,000 or more employees) and midsize companies (500-999 employees) in eight countries across three regions. We also added over 300 IT decision makers from U.S. midsize firms to our initial 600 enterprise respondents. This is the current wave of research.
- In the fall of 2012, we will release a third wave of Horizons BYOD research that will focus on the financial impact of BYOD on companies, and opportunities for maximizing the benefits of BYOD.



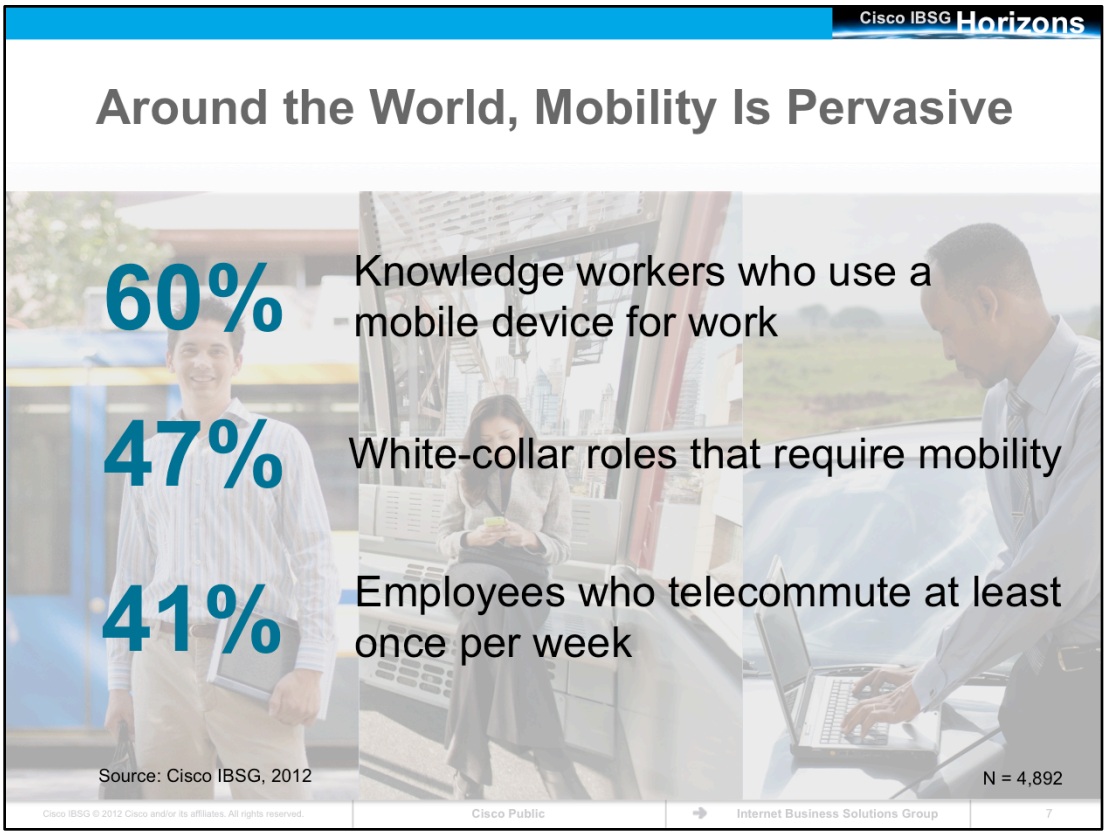
- Overall, we surveyed nearly 4,900 IT leaders who were decision makers or influencers of their companies' mobility solutions.
- Our respondents represented:
  - CIOs, senior vice presidents, vice presidents, directors, and managers
  - About 70 percent were director or higher
- These leaders came from 18 industries, including:
  - Banking and financial services, construction, education, public sector, healthcare, hospitality, information and media, insurance, manufacturing, oil and gas, life sciences, professional services, retail, technology, telecommunications, transportation, utilities, and wholesale distribution



- The study's respondents came from the following regions and countries:
  - The United States
  - Latin America: Brazil and Mexico
  - Asia: China and India
  - Europe: the United Kingdom, France, Germany, and Russia
- This range of countries – and the number of and seniority of respondents – was selected to determine whether BYOD is a trend that crosses geographies and cultures. We also wanted to detect any meaningful regional differences.

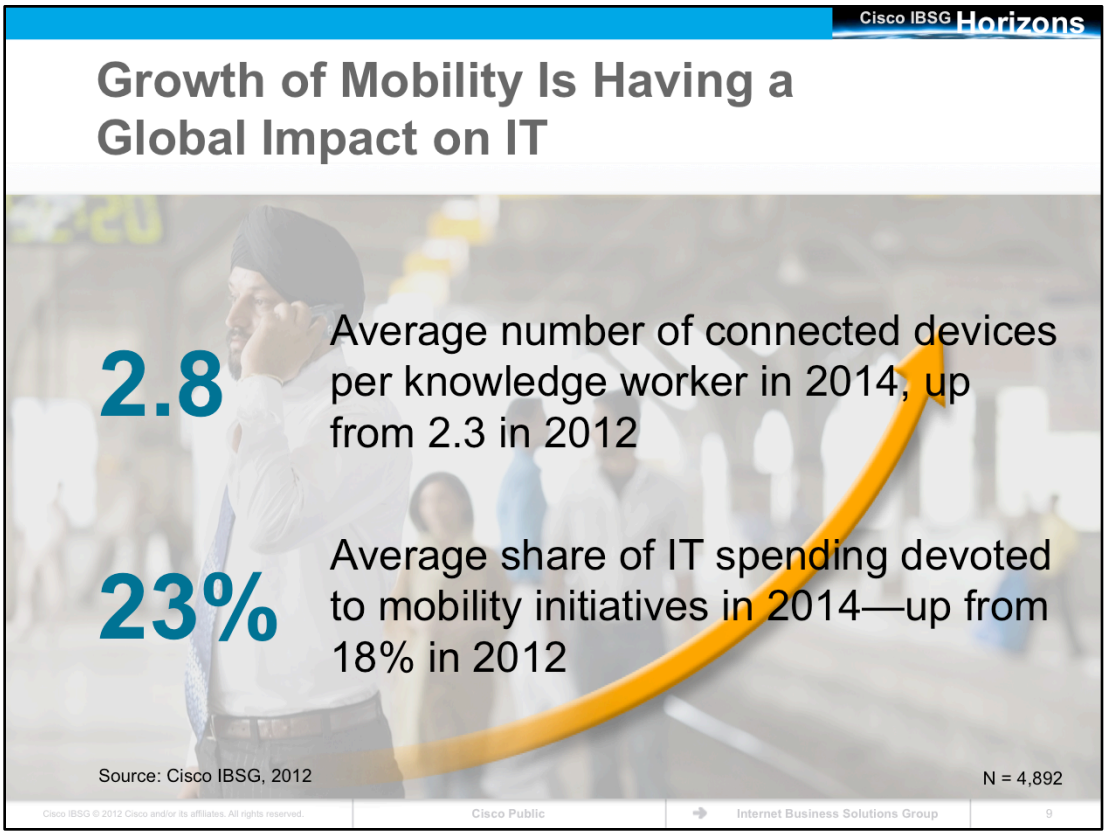


- Our study confirmed that BYOD a global phenomenon: Consistent with the original U.S. study, we found strong evidence of employees using their own devices for work around the world.
- We found that BYOD is not simply about device usage, but freedom and innovation. BYOD empowers employees to innovate using the tools with which they are most comfortable—how and when they want to work.
- There are few differences between midsize companies and enterprises in the rate of adoption or perceived benefits of BYOD.
- Attitudes toward BYOD vary significantly by region: countries such as Brazil, China, India, and Mexico see—and encourage—extensive BYOD, while Europe is more cautious and restrictive.
- We also found that as BYOD becomes more commonplace, companies need to respond with more robust mobile policies and cost-containment strategies, or escalating complexity and costs could threaten some of the gains.
- BYOD also implies new challenges in security.
- We also wondered if desktop virtualization would keep pace with the growing BYOD trend. We found that global IT leaders are aware of desktop virtualization, but implementation is lagging, perhaps because respondents were much more uncertain about its applicability to knowledge workers than in the United States.

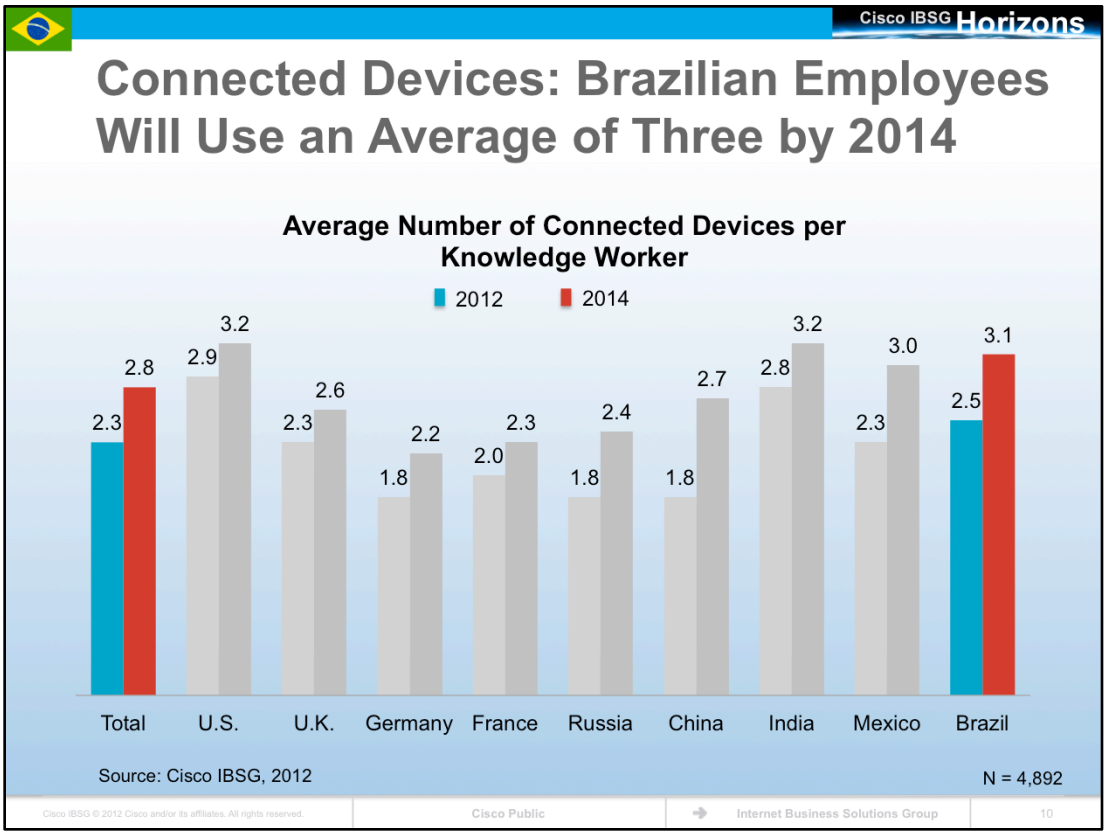


- Mobility means to work away from a traditional office or fixed location on a regular basis.
- Because mobility is pervasive in companies today, the reality is that mobile devices are becoming necessary tools for employees to get their work done.
- 60 percent of employees—by which we mean knowledge workers or white-collar workers—in the companies Cisco surveyed use mobile tools to accomplish their work. These include laptops, smartphones, tablets, and other wireless devices.
- Interestingly, only 47 percent are officially designated as “mobile workers.” Companies are finding that their employees want to use mobile devices to perform their work, even if these devices are not strictly needed for their job roles. In other words, mobility is becoming vital for a wider range of jobs.
- In addition, more than 40 percent of all employees telecommute at least one day per week. The flexibility to move from home to office, and stay connected on the road, is provided by mobile devices.

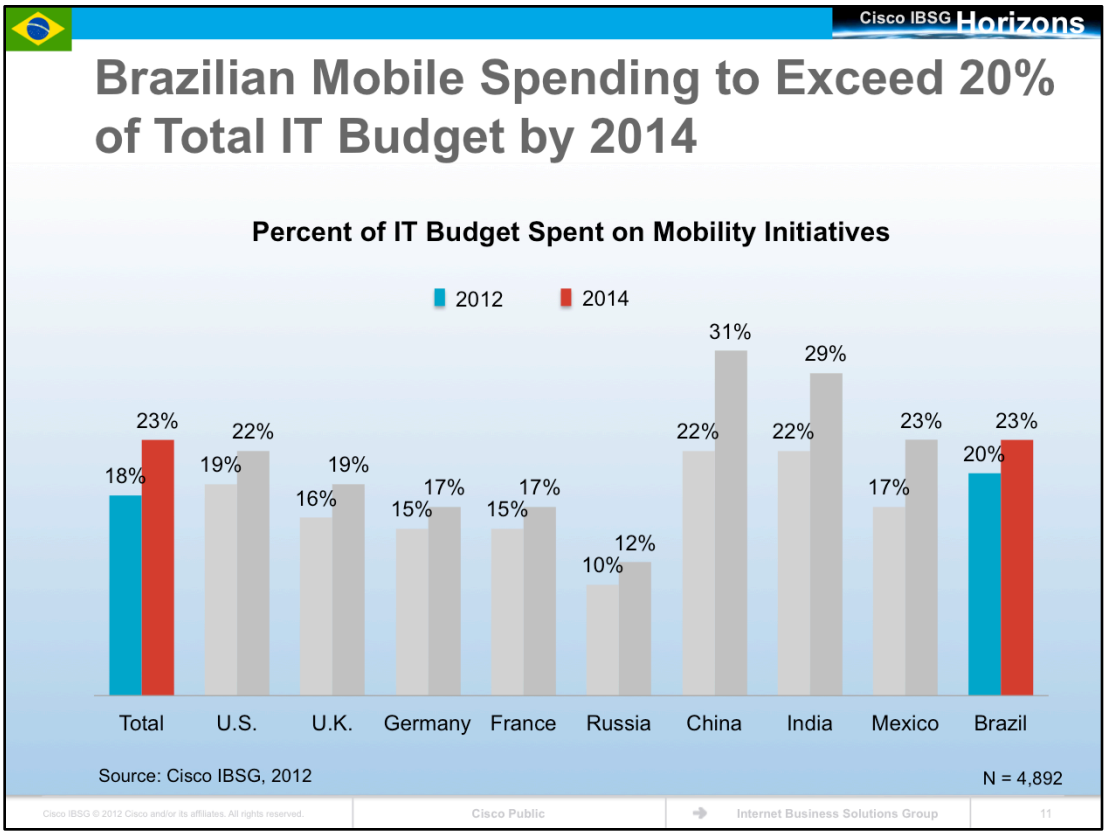
- In Brazil, more than half (57%) of knowledge workers use a mobile device in their jobs. Of the emerging BRIC countries (Brazil, Russia, India, China), the country with the highest mobility was India (69%) and the lowest was Russia (55%).
- In Germany and France, barely half of knowledge workers use mobile devices. We shall see throughout the research findings that European nations, while they see strong usage of mobility in general and BYOD in particular, are behind other countries in perceiving and embracing these trends.



- Employees' need or desire to be mobile and connect to the company network remotely is driving the growth of smartphones, tablets, and other mobile devices.
- The proliferation of these mobile devices in companies is a fact of life, and this means IT needs to change the way it manages devices. This growth in mobility affects data security, access control, platform maintenance, application support, and much more.
- In 2012, knowledge workers had an average of 2.3 devices connected to the network, including smartphones, laptops, tablets, desktops, and so on.
- By 2014, this number will rise to 2.8 mobile devices per knowledge worker.
- This growth in mobile devices will have a profound impact on IT support and network loads. The IT leaders in this study expect the share of IT spending on mobile devices to grow from 18 percent in 2012 to 23 percent by 2014.

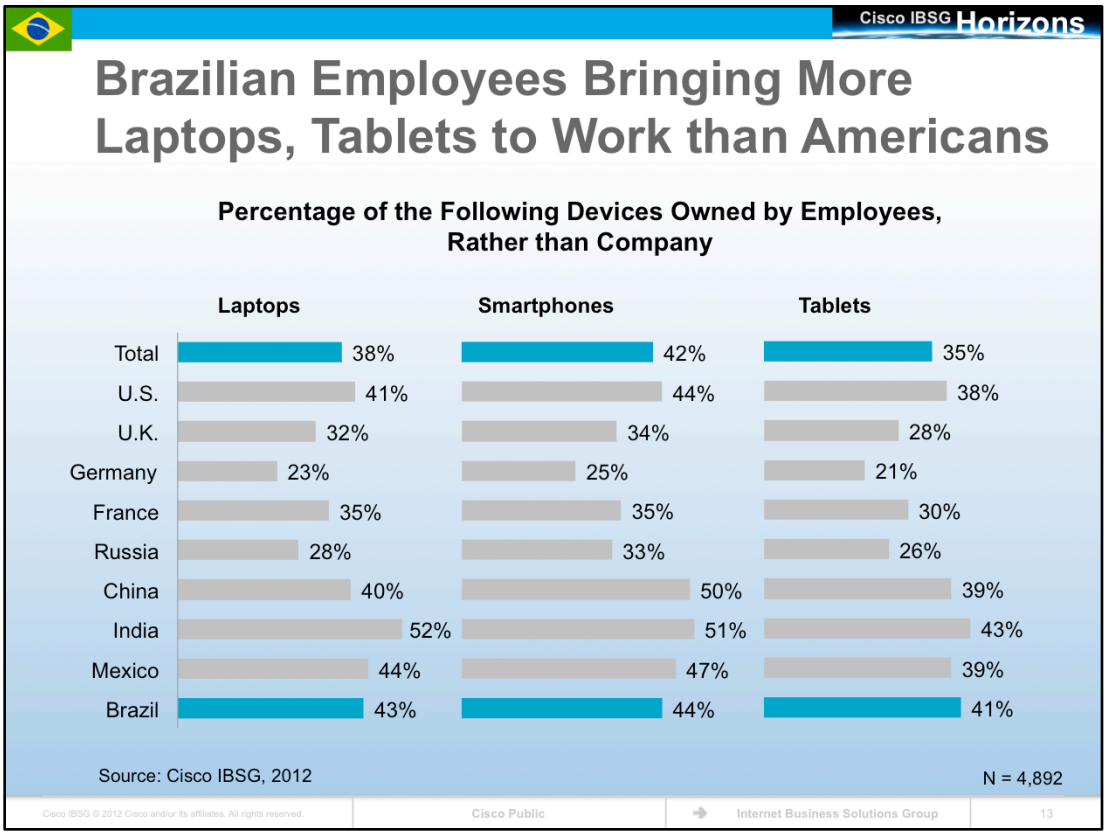


- By 2014, Brazilian knowledge workers will have 3.2 mobile devices per knowledge worker—one of the highest device-per-employee ratios of the countries in the study, just behind India and the United States. This represents a 24 percent growth over the current 2.5 mobile devices per employee.
- The rapid growth of connected mobile devices could put a strain on corporate networks.

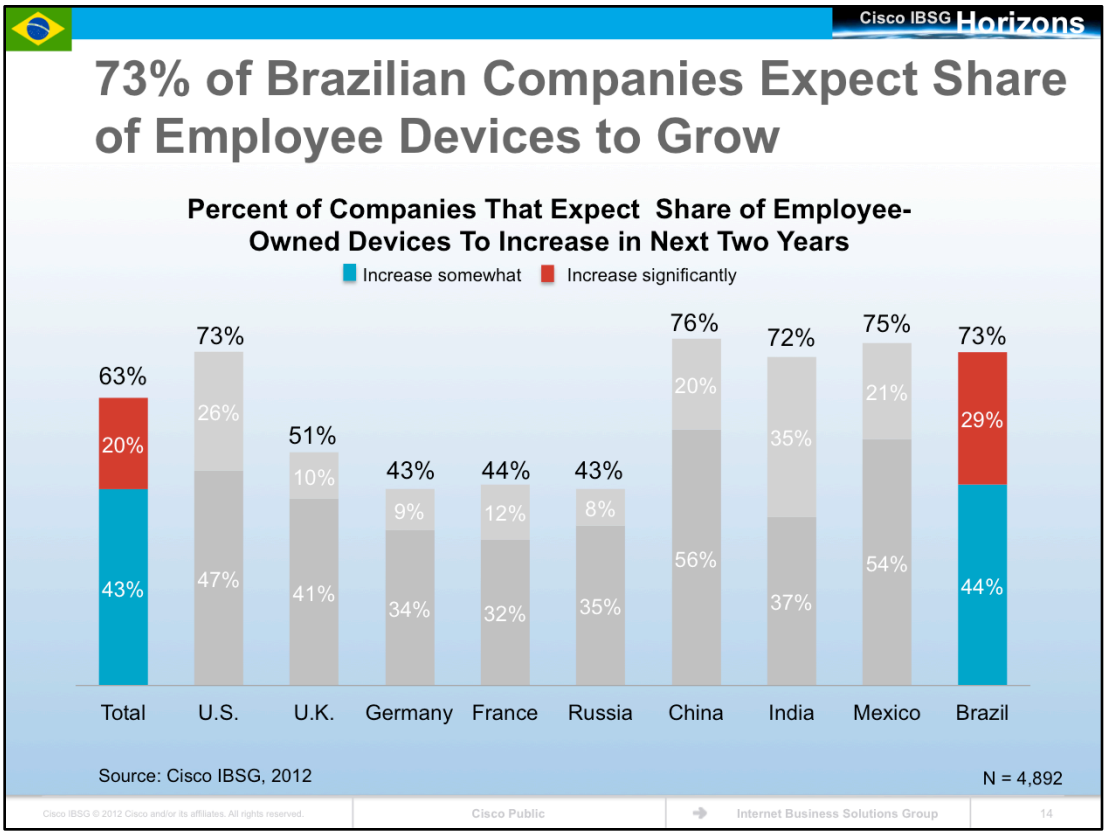


- In Brazil, mobility budgets are expected to grow a modest 15 percent over the next two years, which is slower than the rate of device growth (24 percent).
- However, at 20 percent of total IT budget, mobility spending in Brazil is already one of the highest of all the countries in our study, exceeded only by China and India (both 22 percent).
- Brazilian companies will be looking for ways to reduce their overall mobility spending, while maintaining the benefits of having more employees, and more devices, connected to their networks.

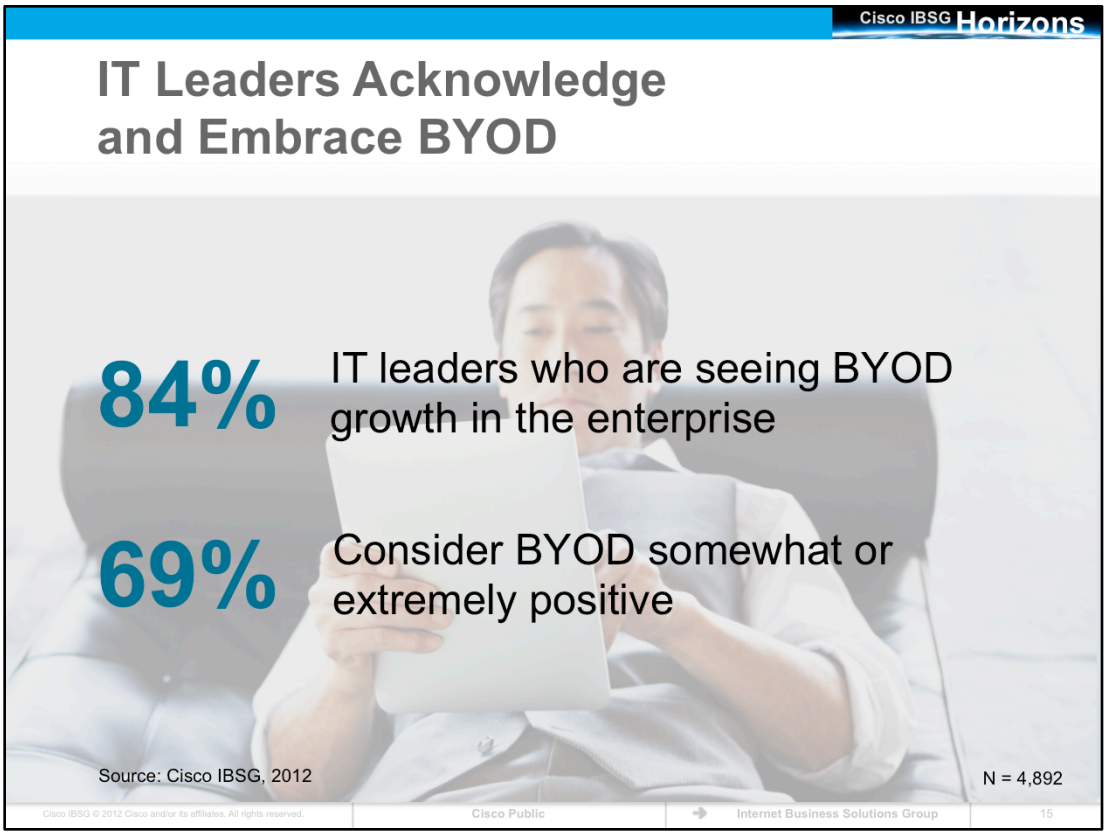
- A large and growing share of the mobile devices employees use for work are owned by employees personally. For example, 42 percent of smartphones and 38 percent of laptops are employee-owned. This shows that BYOD, far from being an emerging trend, is already well-entrenched in corporations throughout the world.
- And IT leaders see strong growth for BYOD in the next two years, with 63 percent saying they expect the percentage of employee-owned devices to increase.



- While the percentage of employee-owned devices across all countries is impressive, Asian and Latin American countries are seeing the highest adoption of BYOD. In Brazil, more than 40 percent of the laptops, smartphones, and tablets used for work are brought by employees themselves.
- In comparison, European countries are far behind. As we shall see, the wariness of European IT leaders and more restrictive IT policies among European companies, including prohibitions on BYOD or lower levels of support, explain some of the difference.

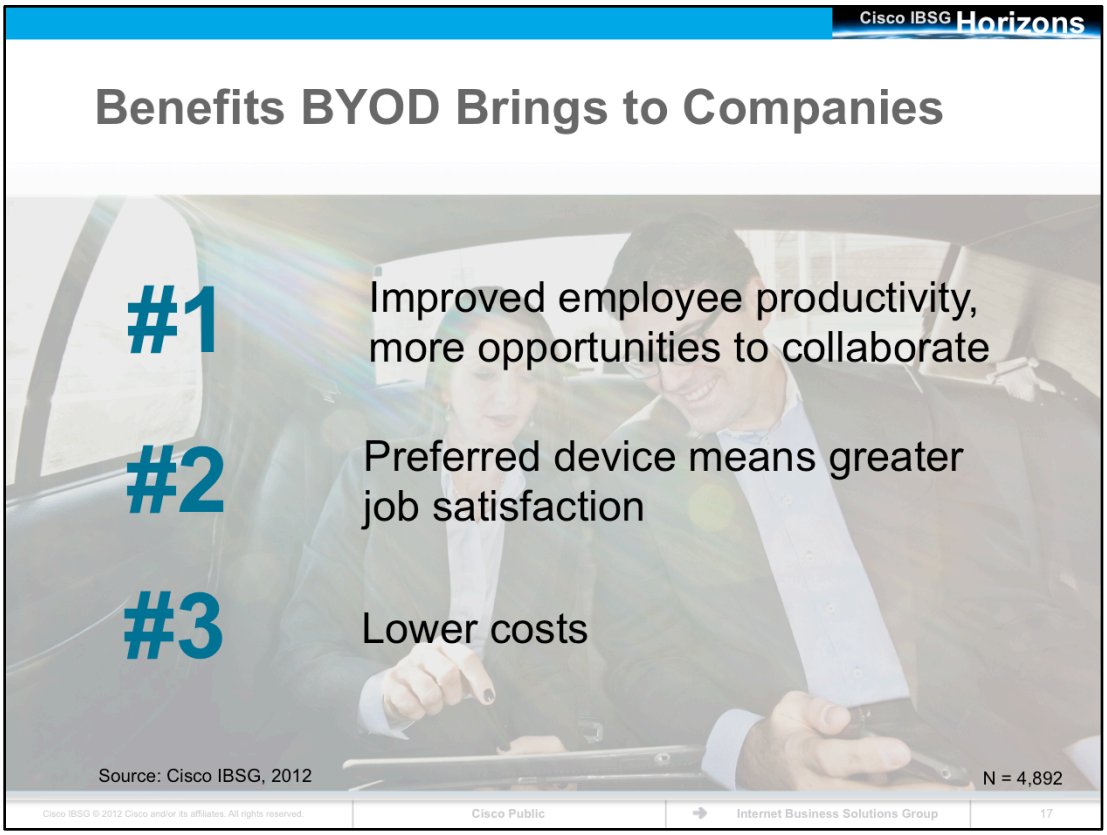


- 73 percent of IT leaders in Brazil expect that employee-owned devices will continue to replace company-issued ones for use in the workplace, a trend that is affirmed in the other BRIC countries, Mexico, and the United States. And 29 percent of Brazilian respondents expect the share employee-owned devices to increase significantly.
- High levels of BYOD penetration, combined with rapid growth, means that the majority of mobile devices in Brazilian companies will soon be employee-owned.

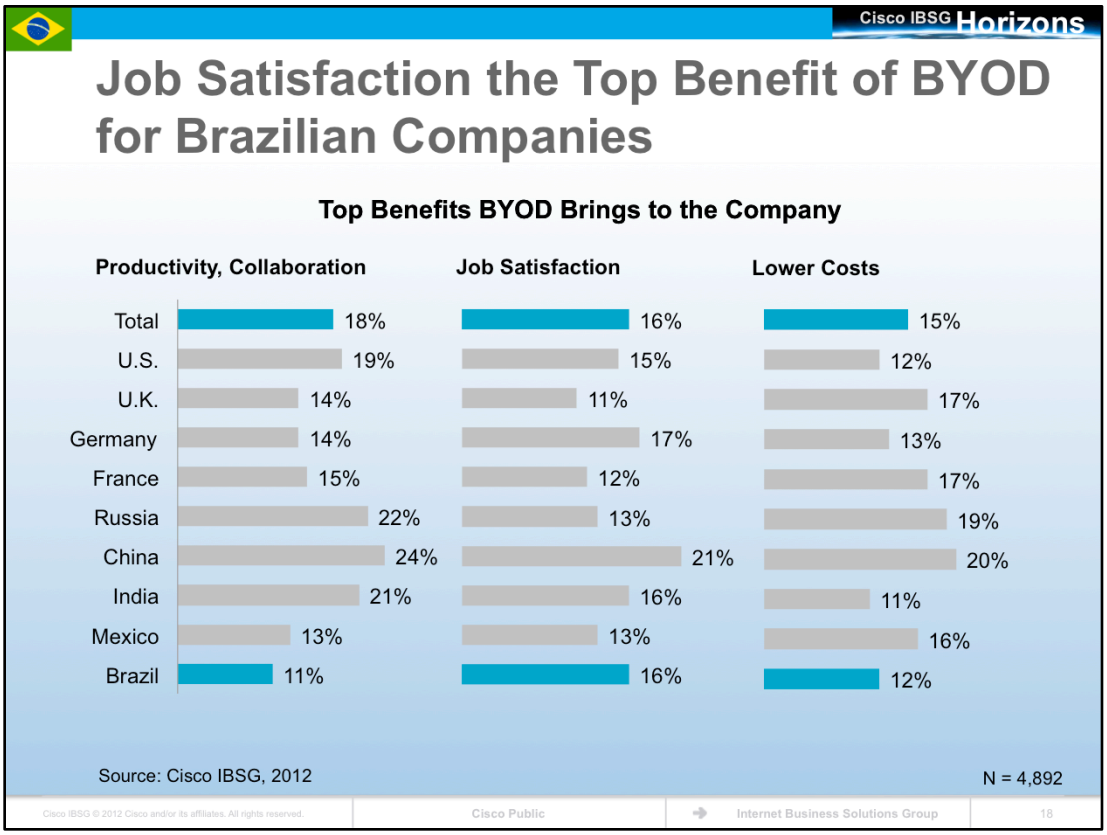


- Eighty-four percent of the IT leaders in this study say they are seeing BYOD growth in their companies.
- Although this poses challenges for these IT leaders, 69 percent say they consider BYOD to be somewhat to very beneficial for their IT departments.

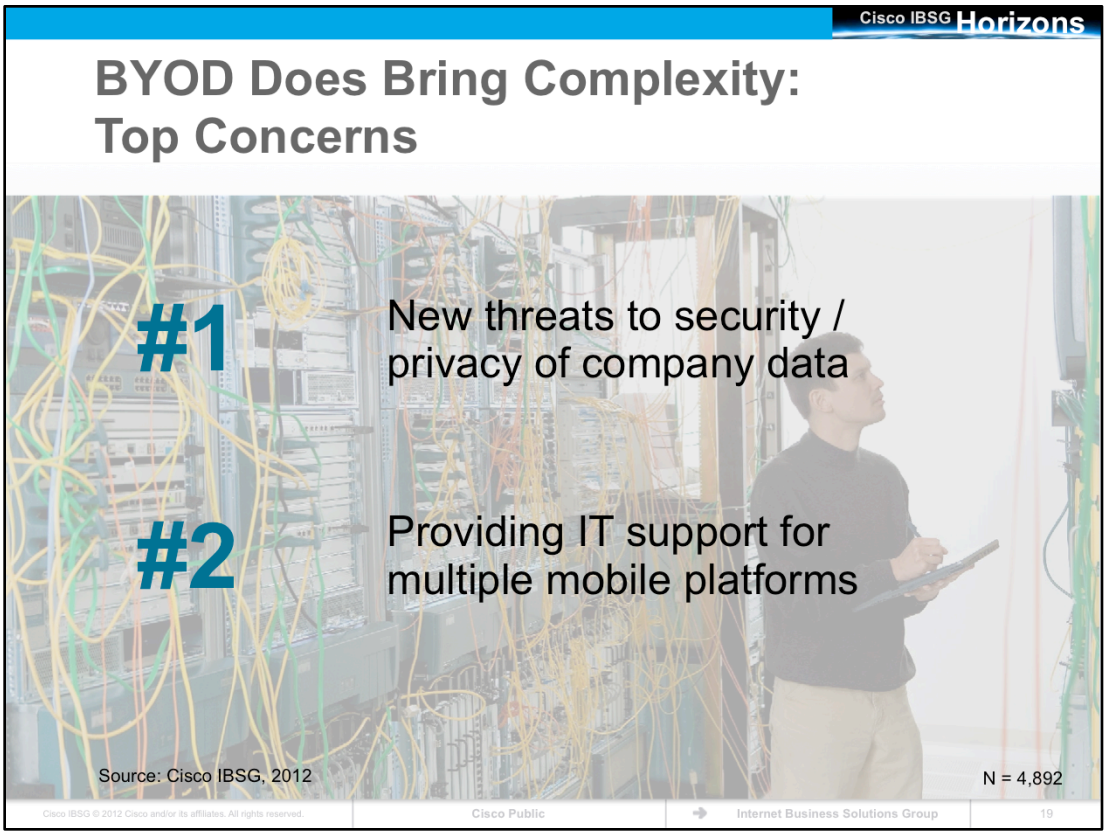
- 84 percent of Brazilian IT leaders acknowledge that work devices are becoming “consumerized,” meaning that employees expect to use the same devices in their personal lives and at work. This is another term for BYOD. And 76 percent of them feel that this is a positive development.
- Even in Europe, where the BYOD trend is less prevalent, 72 percent are seeing growth.
- It is in the sentiments of IT leaders that we see the greatest gulf. In Europe, particularly the United Kingdom, Germany, and France, IT leaders are far less positive about the impact of BYOD than in the rest of the countries we surveyed.



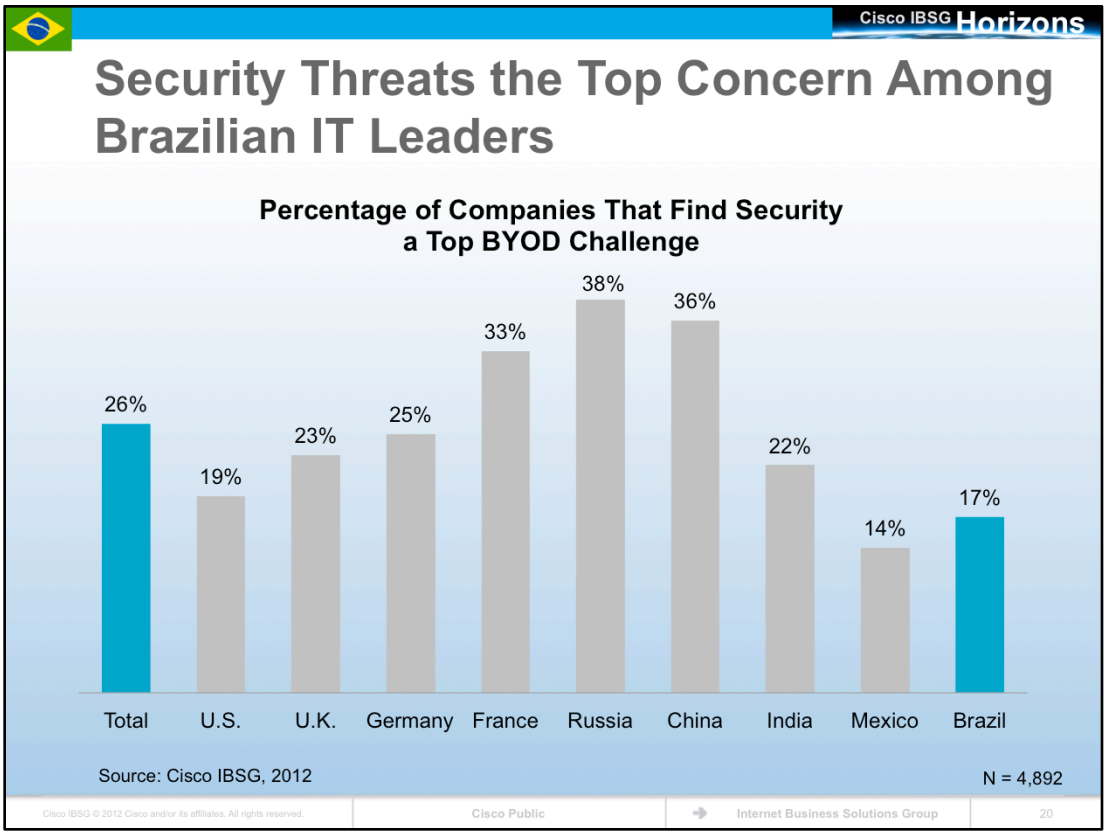
- The top benefits of BYOD for companies are:
  - **Productivity:** Employees become more productive, and they can collaborate with each other and those outside the company more easily.
  - **Job satisfaction:** Employees want to use the same devices for work that they use in their personal lives. When employees can choose their own devices, they are happier and more satisfied in their work.
  - **Lower costs** when employees pay for their devices.



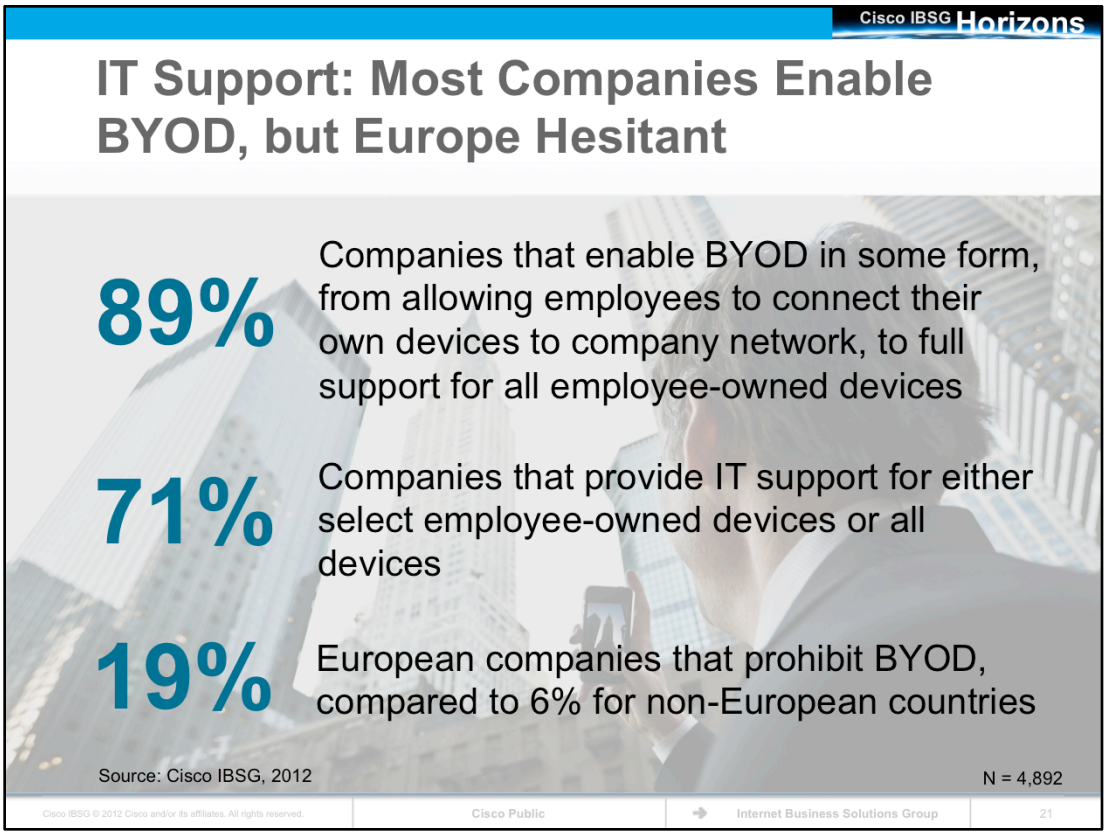
- Overall, the primary benefit IT leaders see from BYOD is increased employee productivity. This is an important finding, because fears that employees would be distracted by personal applications and content (such as using social networks, playing games, using unauthorized sites for personal business and entertainment) have been an argument against BYOD.
- In Brazil, the top benefit of BYOD was higher employee job satisfaction (16 percent). Access to the latest mobile technology, while not one of the top three choices globally, was number two in Brazil. With BYOD, employees can use functionalities and “apps” that traditionally are not provisioned by IT departments. With open BYOD policies, companies can capture the value these technologies offer.



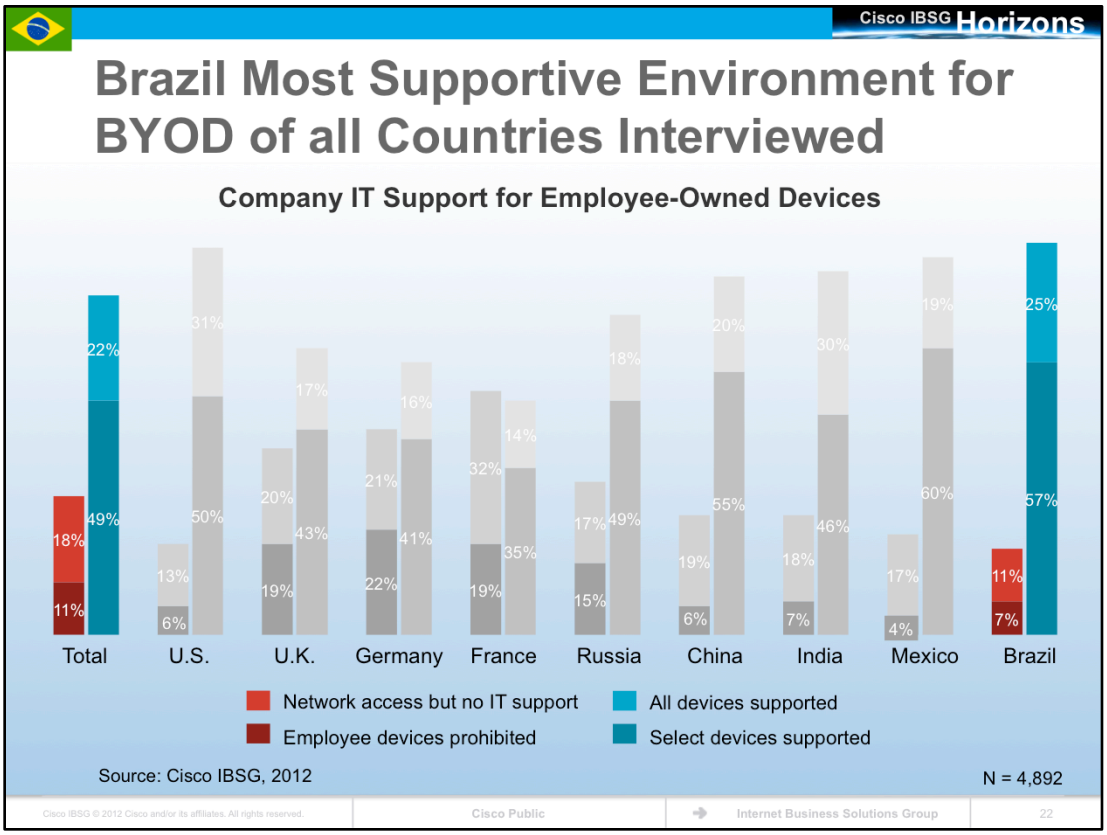
- The international results are consistent with what we found in the United States regarding the main drawbacks of BYOD. The top concerns according to the IT leaders in this study are:
  - **Security—**How do companies ensure their data, and the data of their customers, is secure?
  - **Support—**How do IT departments support multiple devices, platforms, and applications?
- Additionally, IT leaders are concerned about access: Since mobile devices open new paths of intrusion, how do IT departments enforce policies to ensure that only authorized people have access to sensitive information, and how do they maintain regulatory compliance?



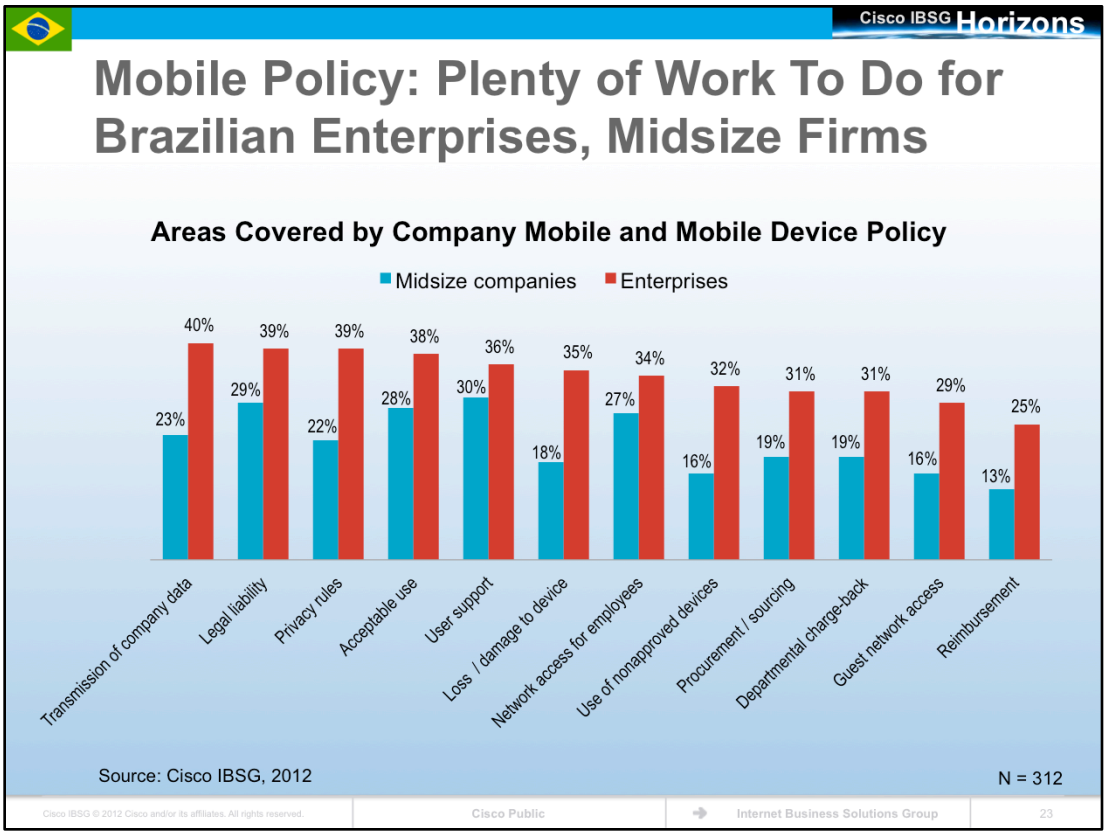
- While Brazilian IT leaders had a wider range of concerns than other countries, security was still number one (17 percent) followed by:
  - Increased complexity of IT support (14 percent)
  - Employee devices could damage other company assets (11 percent)
  - Decreased control / supervision (10 percent)
  - New risks in regulatory compliance (10 percent)
- The perceived danger of BYOD to corporate network security is likely a major reason that companies in Europe have not embraced the trend as fully as others. With the exception of China, European countries are the most concerned with the negative effects of BYOD on the security of corporate networks. Interestingly, the concerns over network security have not made Chinese companies reluctant to embrace BYOD, since they believe the benefits far outweigh the potential costs.



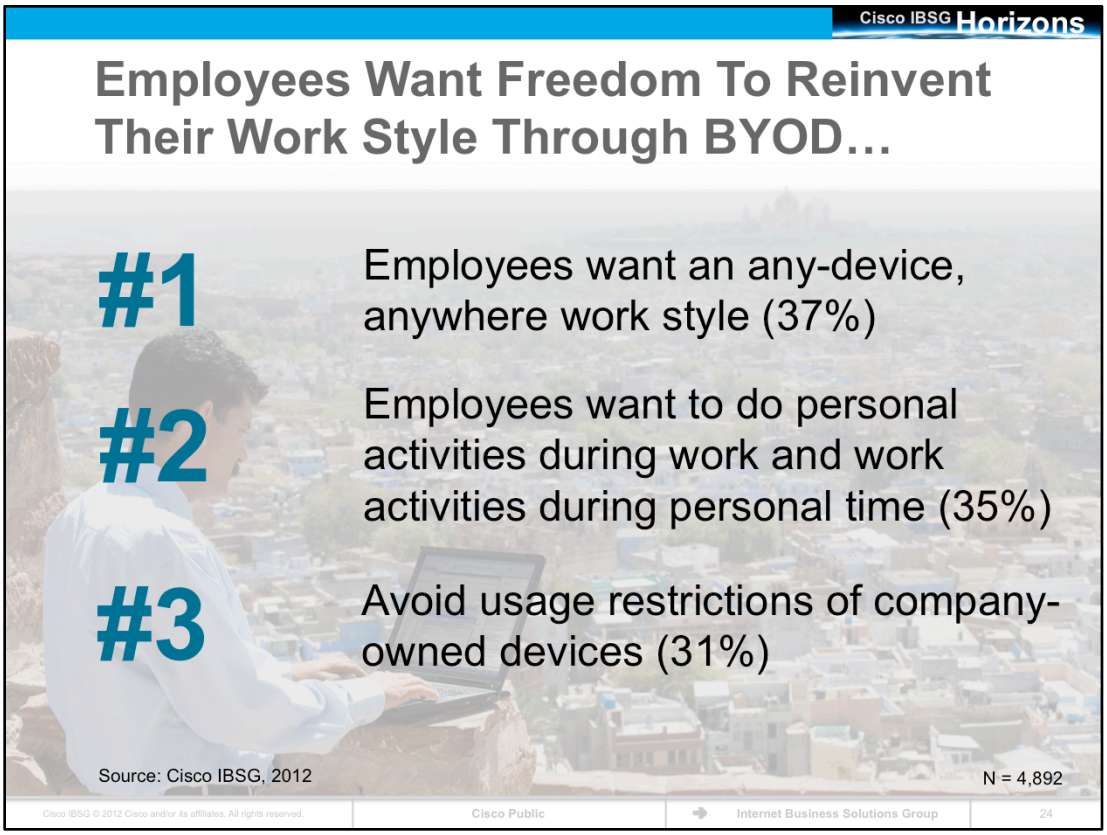
- Overall, there is strong support for enabling BYOD among corporate IT leaders. Nearly 90 percent of companies accept BYOD in some form, ranging from simply allowing employee-owned devices on the corporate network to full IT support for any employee-owned device. This proves once again how universal the BYOD trend has become.
- And 71 percent encourage IT by providing some level of IT support.
- European companies, however, are much less accommodating of employee-owned devices in the workplace.



- Brazil had the most supportive environment for BYOD of all countries interviewed, with 82 percent of companies supportive of some or all devices, compared to 81 percent in the United States, 79 percent in Mexico, and 71 percent global average.
- The United States and India provide the most comprehensive support for employee-owned devices, with about 30 percent of companies offering IT support for all devices.
- Brazil has the overall least restrictive policies, with 82 percent of companies supporting either select or all employee-owned devices.
- The countries in which IT leaders were least positive about the impact of BYOD – France, Germany, and the United Kingdom – have the most restrictive policies. In France, for example, a higher percentage of companies either prohibit employee-owned devices in the workplace or offer only network access, with no other forms of support.



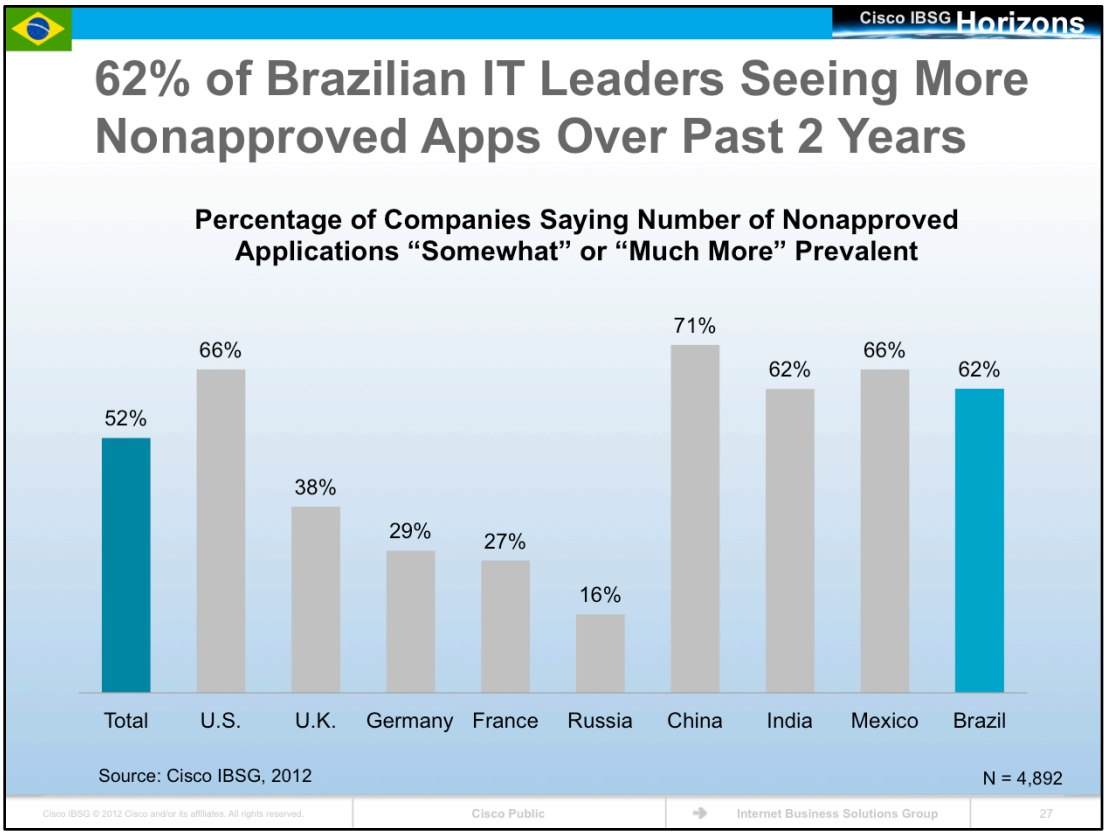
- Another area that has the potential to restrict the potential benefits of BYOD is a lack of clarity around mobility policy, both as it pertains to BYOD and in general. Regarding the maturity of corporate mobile policy, enterprises have implemented more comprehensive policies in most areas than midsize firms. While this finding is not surprising, it speaks well for midsize firms that in many areas, the differences between them and enterprises are modest.
- On the negative side, for both corporate and midsize firms, there is plenty of work to be done before mobility policy can be considered robust.
- For example, only half of enterprises and 41 percent of midsize firms have a policy in place regarding employee network access for mobile devices.
- In Brazil, as in most other countries surveyed, enterprises were ahead of midsize companies in terms of areas covered by mobility policy, but by no means were the policies in enterprises robust.
- The policy areas in which midsize Brazilian companies have the most catching up to do include:
  - Loss / damage to device (35 percent enterprise, 18 percent midsize)
  - Use of non-approved devices (32 percent enterprise, 16 percent midsize)
  - Privacy rules (39 percent enterprise, 22 percent midsize)
  - Transmission of company data (40 percent enterprise, 23 percent midsize)



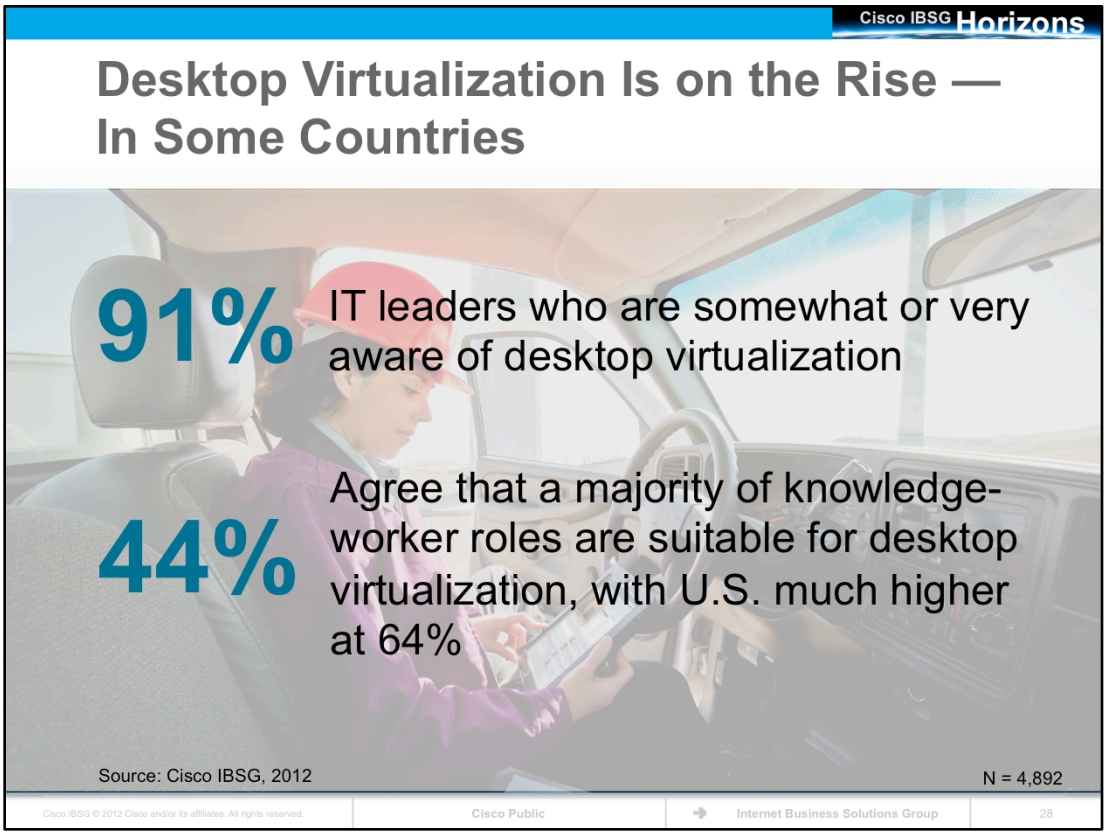
- Employees are turning to BYOD because they want more control of their work experience, thus improving productivity and job satisfaction.
- Their first desire is device choice. They want to work on the device with which they are most comfortable, and they want to work wherever they need to be.
- Their second desire is to choose when they do what. They want the flexibility to undertake personal activities while at work and to do their work during nontraditional work periods such as nights and weekends.
- Finally, they want freedom to use the device the way they see fit, including which apps to download.

- By giving employees freedom to choose the devices, applications, and cloud services they use, work processes can be redefined. Employee-led innovation extends far beyond when and where to work.
- Through BYOD, employees can continually innovate in a multitude of ways, such as using cloud-based services to analyze and visualize data on a mobile device, discovering the perfect tool for managing complex workflows, or recording video meetings to improve execution when decisions are made.
- The potential for consistent bottom-up innovation is tremendous, and the tools are readily at hand: increasingly inexpensive, powerful devices; thousands of mobile applications with enterprise-level power and sophistication that cost only a few dollars; and application-development tools that nonexperts can use to quickly design their own custom applications.

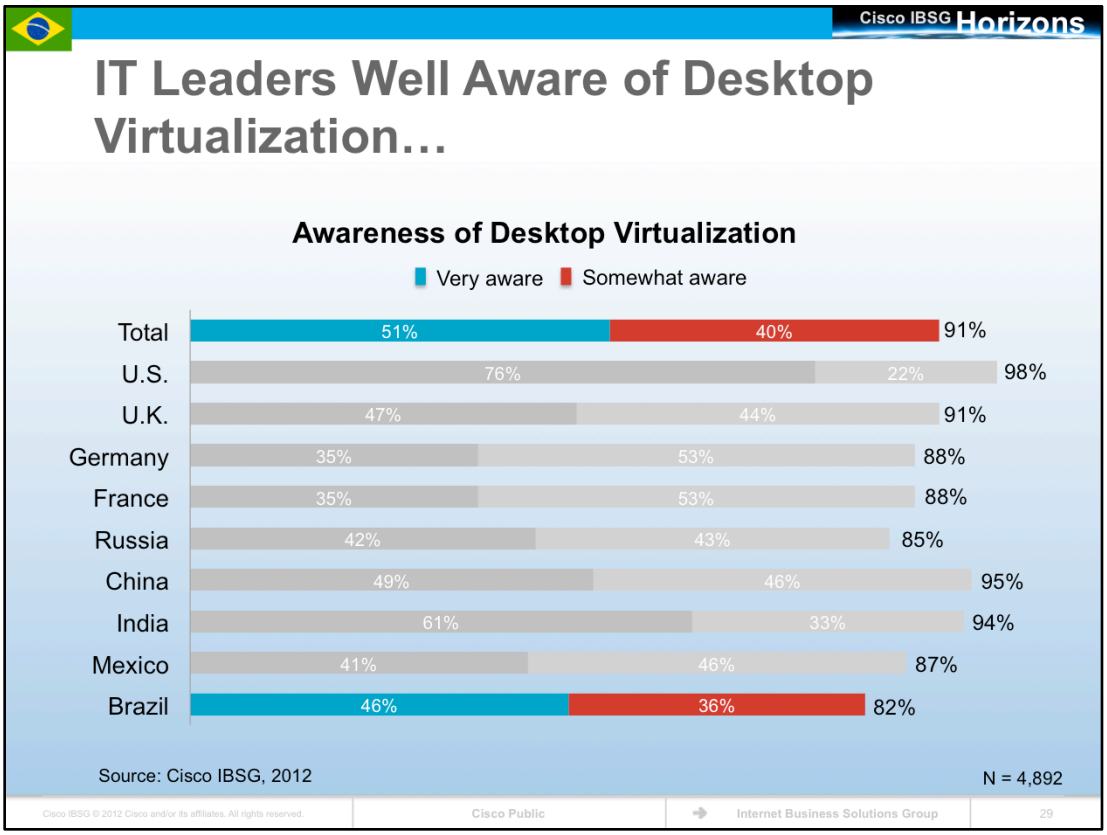
- Along with the growth of employee-owned devices, 52 percent of IT leaders say that nonapproved software applications and cloud services are “somewhat” or “much more” prevalent today than two years ago. It makes sense that nonapproved applications would increase, since employees do not simply want to use the device of their choice, but also the software and cloud services they prefer.
- European countries are seeing far less growth, perhaps because of policy restrictions that discourage them.



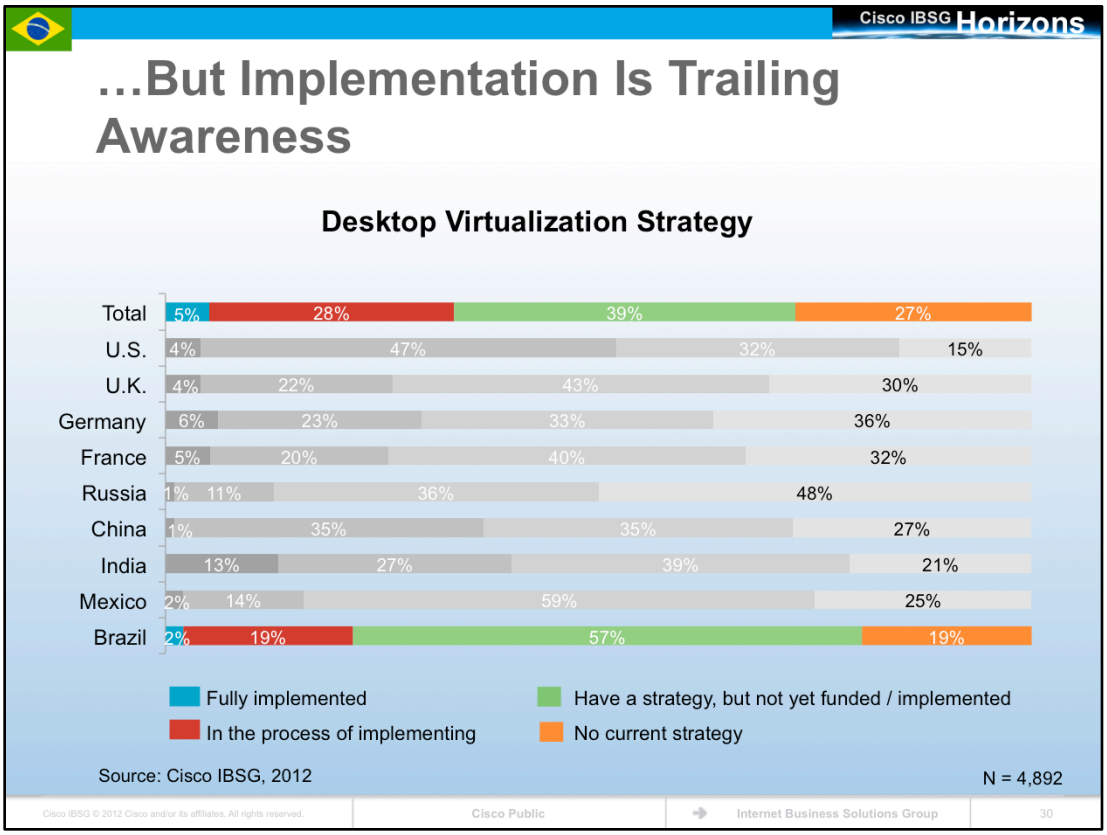
- 62 percent of Brazilian IT leaders are seeing more nonapproved apps in the workplace, compared to 71 percent in China, 66 percent in the United States, and 66 percent in Mexico.
- As we can see, there is a stark difference in the prevalence of nonapproved applications between European countries and all other countries in our study. In Russia, for example, only 16 percent of IT leaders say they have seen more nonapproved applications, versus 71 percent in China.
- We may be seeing both *virtuous* circles (positive impressions of BYOD, resulting in more favorable policies, thereby producing enhanced benefits and increasing enthusiasm) and *vicious* circles (suspicion of BYOD, resulting in restrictive policies and muted impact, reinforcing the initial skepticism) at play.



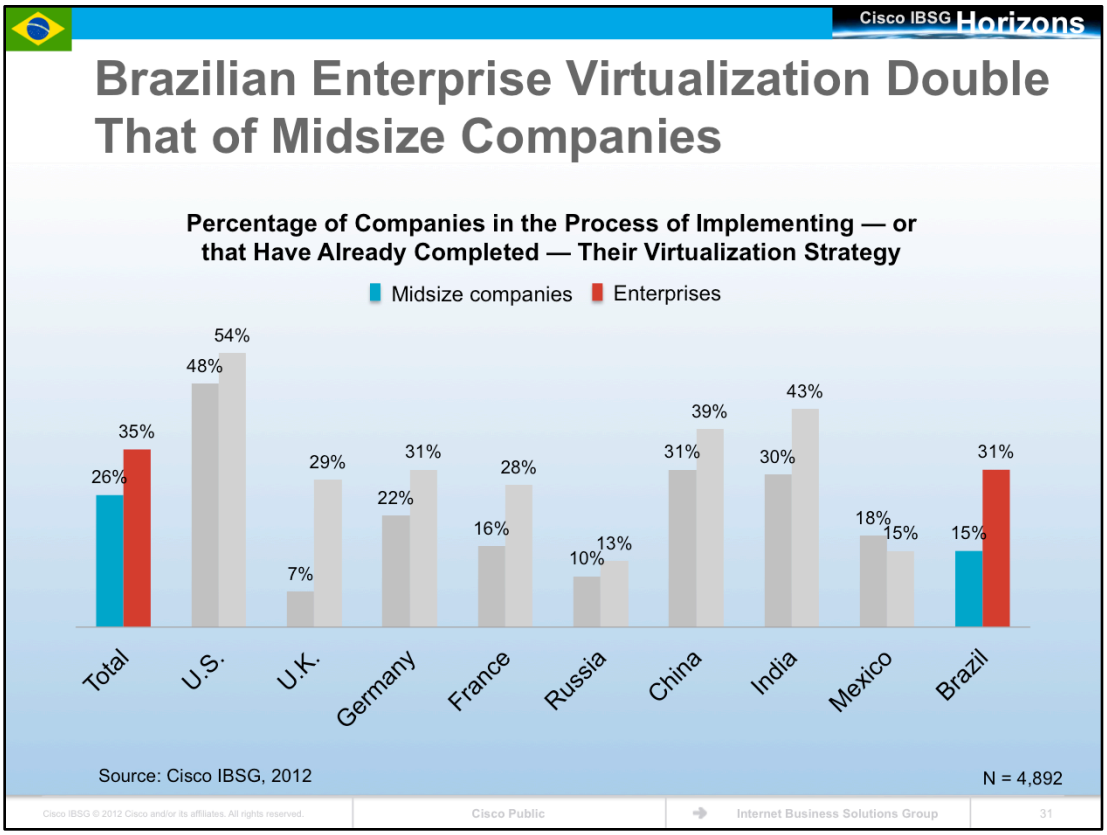
- This study also explored desktop virtualization, which is becoming increasingly popular—and which could potentially fit nicely with the BYOD trend.
- Desktop virtualization separates the desktop environment from the device and enables employees to get the same or similar experience regardless of where they are or which device they are using.
- This study found that desktop virtualization is very much on the minds of IT leaders. Of the IT leaders polled in this study, 91 percent are very or somewhat familiar with desktop virtualization.
- However, outside the United States, where 64 percent of IT leaders believe a majority of knowledge workers could benefit from desktop virtualization, companies feel virtualization has limited applicability for knowledge workers.
- Desktop virtualization is also sometimes called:
  - Virtual desktop infrastructure (VDI)
  - Hosted virtual desktop (HVD)
  - Desktop as a service (DaaS)
  - Server-based computing



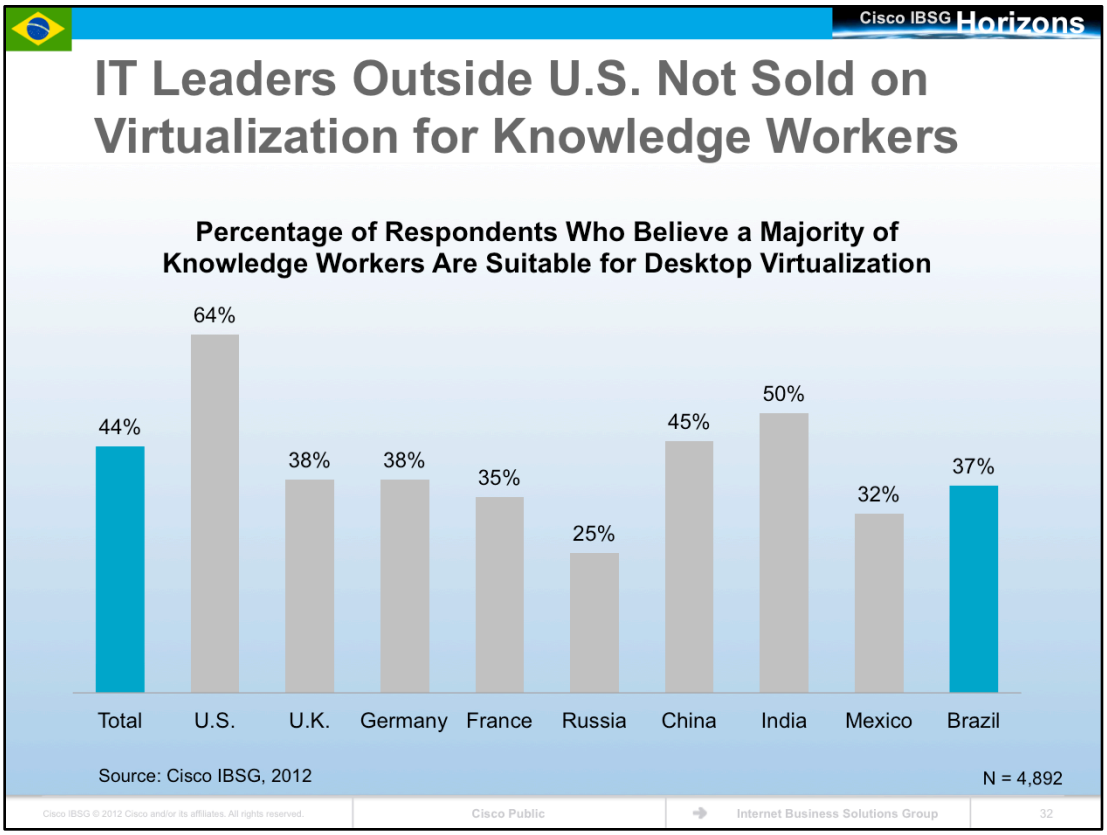
- For IT leaders in the United States and India, desktop virtualization is a well-known concept. Elsewhere, less than 50 percent are “very aware,” although nearly all have some familiarity.
- Of all of the countries surveyed, Brazil had the overall lowest awareness of desktop virtualization (82 percent, compared to 91 percent global average, and 98 percent in the United States).



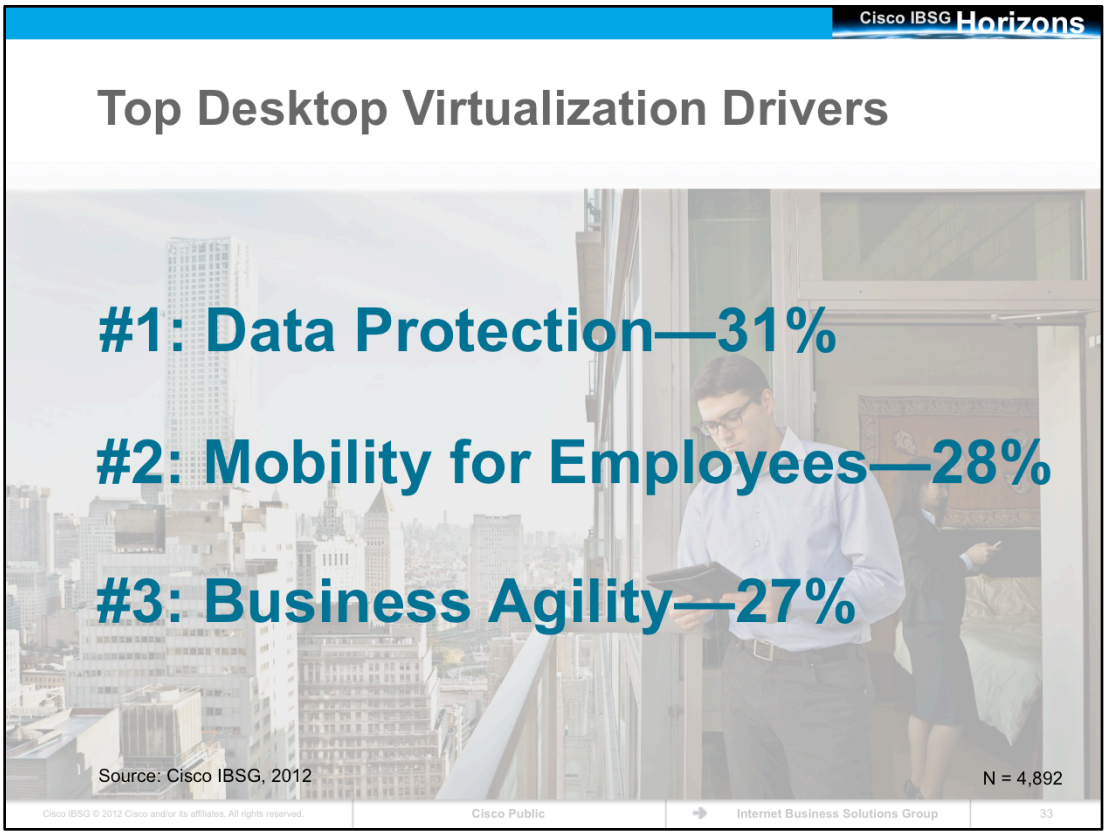
- That said, 81 percent of companies in Brazil have a desktop virtualization strategy designed or are implementing one. However, relatively speaking, Brazil is behind in implementation, compared to the United States (51 percent having implemented or in the process of implementing), India (40 percent) and China (36 percent).
- Only the United States has a majority of companies implemented desktop virtualization, or are in the process of implementing it.
- There are some bright spots in the rest of the world, though. In India, 13 percent of companies have fully implemented desktop virtualization, and in China, it is on the radar, with 35 percent in the implementation process.
- For several other countries, though, such as Russia and Mexico, desktop virtualization is a lesser priority.



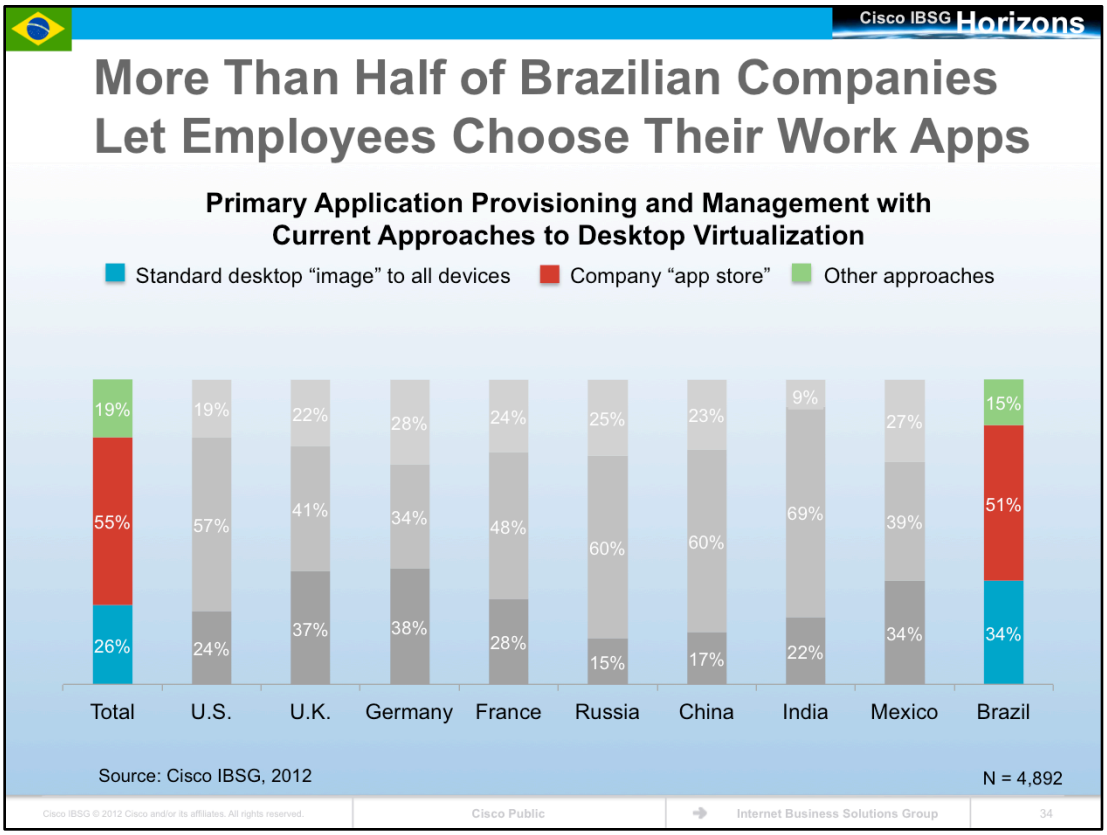
- For the most part, enterprises are well ahead of midsize firms in implementing desktop virtualization.
- 31 percent of Brazilian enterprises have implemented or are in the process of implementing their desktop virtualization strategy, compared to only 15 percent of midsize companies.
- While enterprises were ahead in all other countries surveyed except Mexico, the difference between midsize and enterprise companies is greatest in Brazil and the United Kingdom.
- In Mexico, midsize companies are actually more likely to have their virtualization strategy in place than local enterprises.



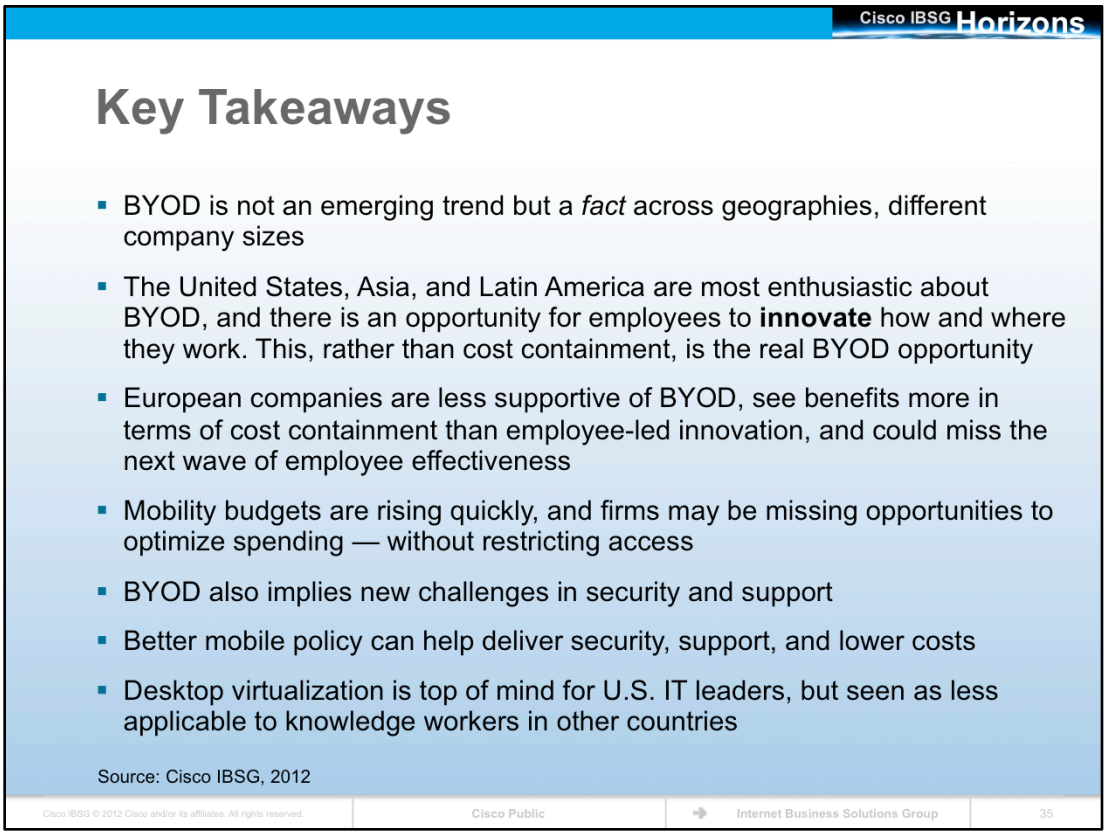
- IT leaders outside of the United States are “behind” in implementing desktop virtualization because they believe it to be less applicable to knowledge workers than do their U.S. counterparts.
- In Brazil, 37 percent of respondents indicated that desktop virtualization was suitable for half or more of the workforce. Other countries with similar perceptions were France (35 percent believed it was suitable for half or more of employees) and the United Kingdom and Germany (both 38 percent).



- Most IT leaders recognize that employees in their organization could benefit from desktop virtualization (44 percent believe half or more of their employees could benefit), but desktop virtualization poses challenges. The top three concerns are:
  - **Data protection:** How does the enterprise ensure only the right people have access to sensitive company and customer data?
  - **Mobility for employees:** Enabling employees to work from wherever they are, rather than being constrained to a desk or campus, including telework.
  - **Business agility:** The speed with which companies can roll out software updates and platforms.



- IT leaders are accustomed to pushing approved devices and applications on to employees—when a new employee starts, he or she has a laptop and a standard set of office applications set up and ready to use. But with employees bringing their own devices, IT departments are changing the way they provision and manage devices.
- IT leaders who accept this sea change are embracing it by supporting nonstandard applications and distributing them through a corporate app store.
- The following describe how IT leaders are provisioning and managing today:
  - Employees download approved and nonstandard applications from a company app store—55 percent
  - The IT department pushes images for approved applications to all employees' desktops—26 percent
  - Other approaches, including provisioning based on job role—19 percent
- In Brazil, over half of respondents indicated that they are letting employees "pull" work applications from a company app store as needed, while 34 percent are "pushing" standard applications. This trend lines up with the global trend, in which the company app store is more prevalent than the standard desktop image.



- As we have seen, BYOD is happening in companies across the world, at both midsize companies and enterprises. It is not an emerging trend, but a fact.
- There are varying degrees of support and enthusiasm, however. The United States, Asia, and Latin America are bullish on the prospects of BYOD, and are willing to give employees more control.
- By giving them control, companies can allow employee-led innovation to unfold, as knowledge workers find better ways of performing their typical tasks, and even expand into higher-value work. For example, the ability to download powerful data analytics applications that formerly were provided only to specialists can now help any employee add value in new ways.
- Companies must guard against rising mobility costs.
- They must also face new challenges in how they secure their networks and support mobile devices in a BYOD environment.
- For many companies, better, more comprehensive mobile policies could help deliver BYOD with greater security at a lower cost.
- Desktop virtualization could also help. But IT leaders outside the United States see desktop virtualization as less applicable to knowledge workers, and are not implementing it as extensively.