

Introdução ao Desenvolvimento para Dispositivos Móveis

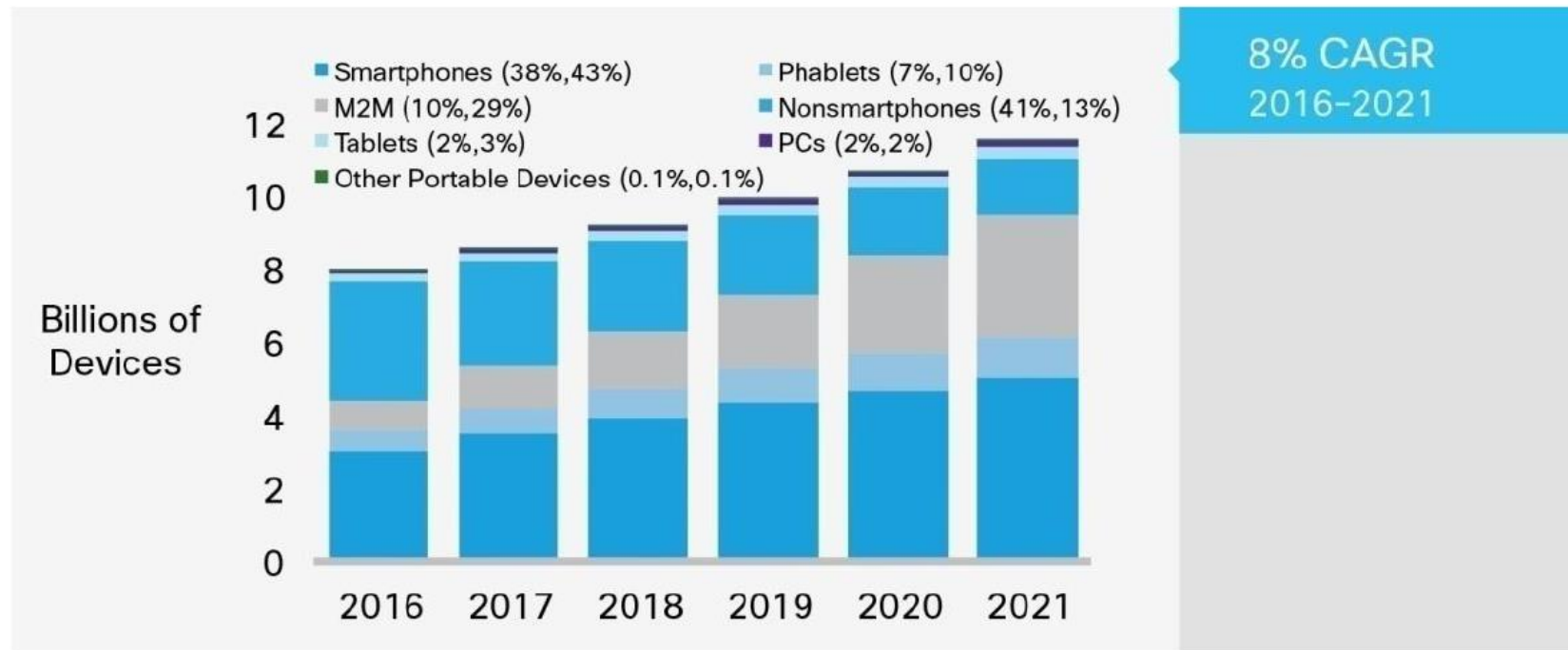
- Apresentação da disciplina
- Conceitos básicos
- Recursos para desenvolvimento

Referências

- DEITEL, Abbey, DEITEL, Paul, DEITEL, Harvey. Android para programadores: uma abordagem baseada em aplicativos. 2 ed. Porto Alegre: Artmed. 2015.
- <http://developer.android.com>
- Programming Handheld Systems – Prof. Adam Porter of University of Maryland (<https://www.coursera.org/course/android>)
- <https://developers.google.com/university/courses/mobile>
- <http://oreilly.com/training/androidapps>

Popularização dos dispositivos móveis

Figure 4. Global Mobile Devices and Connections Growth



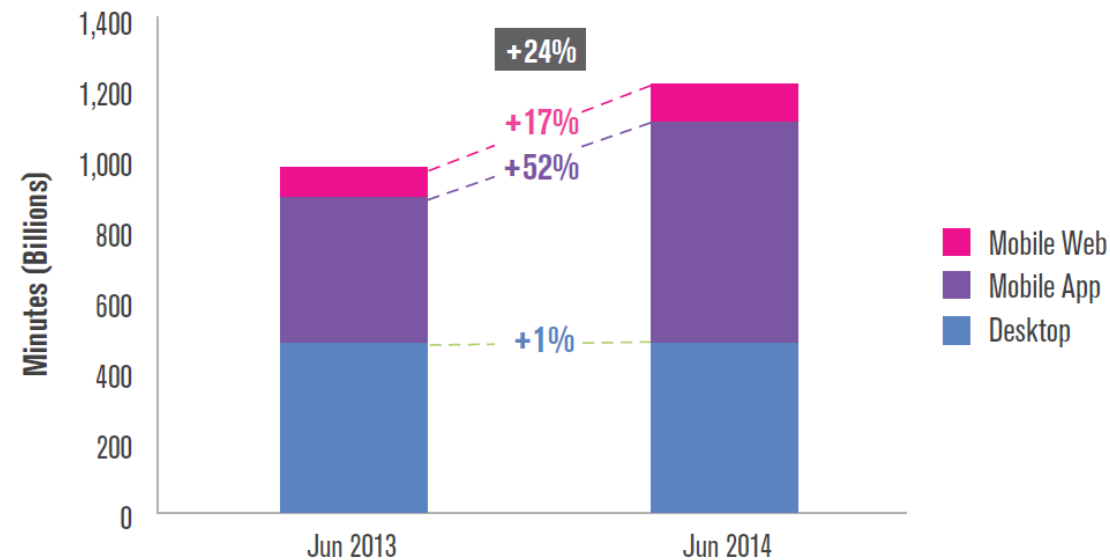
Note: Figures in parentheses refer to 2016, 2021 device share.

Source: Cisco VNI Mobile, 2017

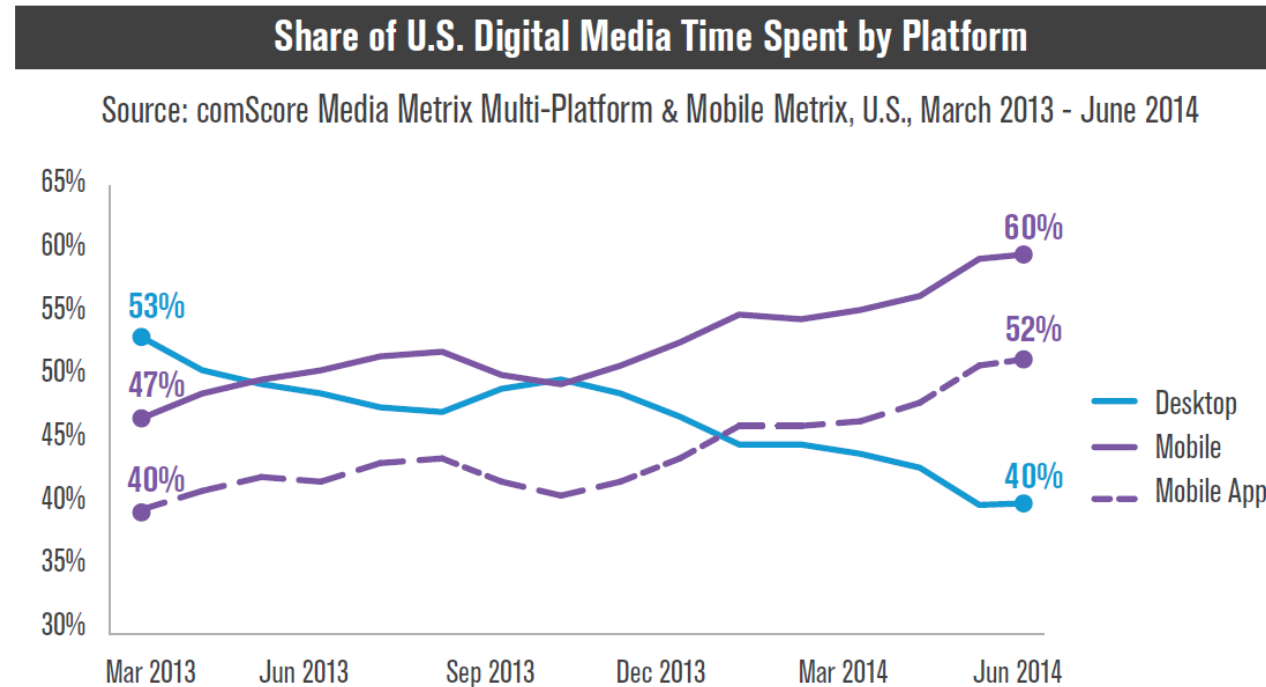
Popularização dos dispositivos móveis

Digital Time Spent Growth Driven by Apps

Source: comScore Media Metrix Multi-Platform & Mobile Metrix, U.S., June 2013 - June 2014



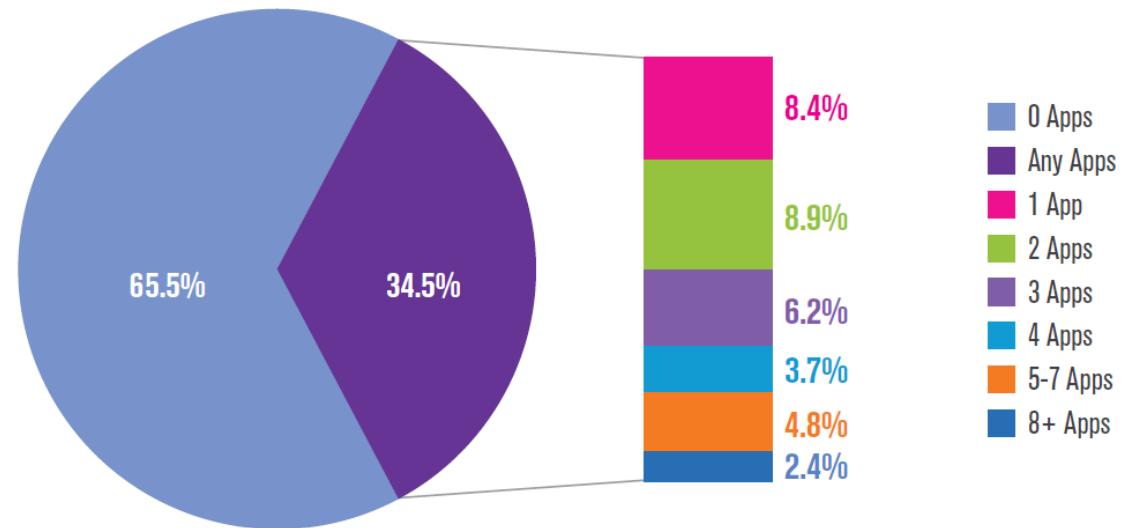
Popularização dos dispositivos móveis



Hábito dos usuários

Smartphone Users' Number of App Downloads Per Month

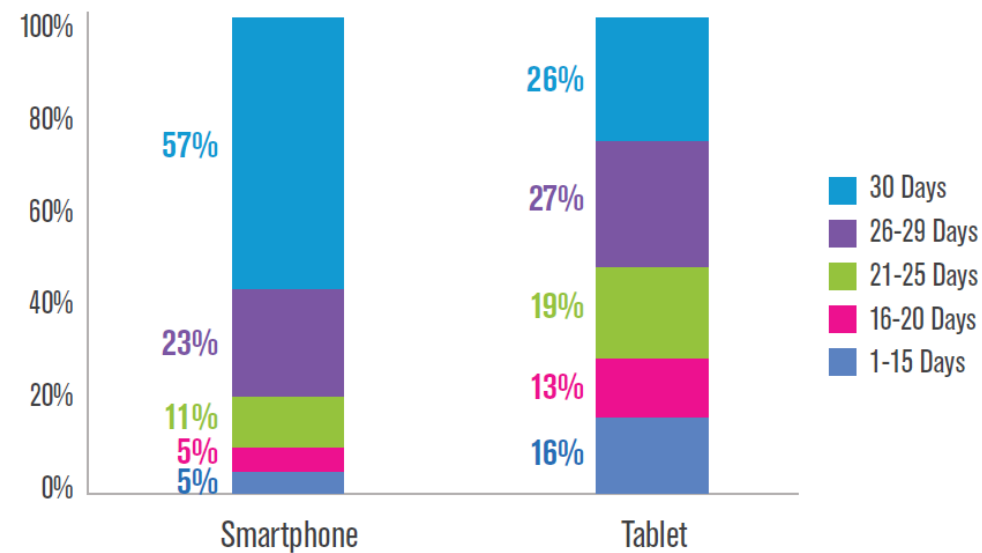
Source: comScore MobiLens, U.S., Age 18+, 3 Month Average Ending June 2014



Hábito dos usuários

Number of App Usage Days Per Month

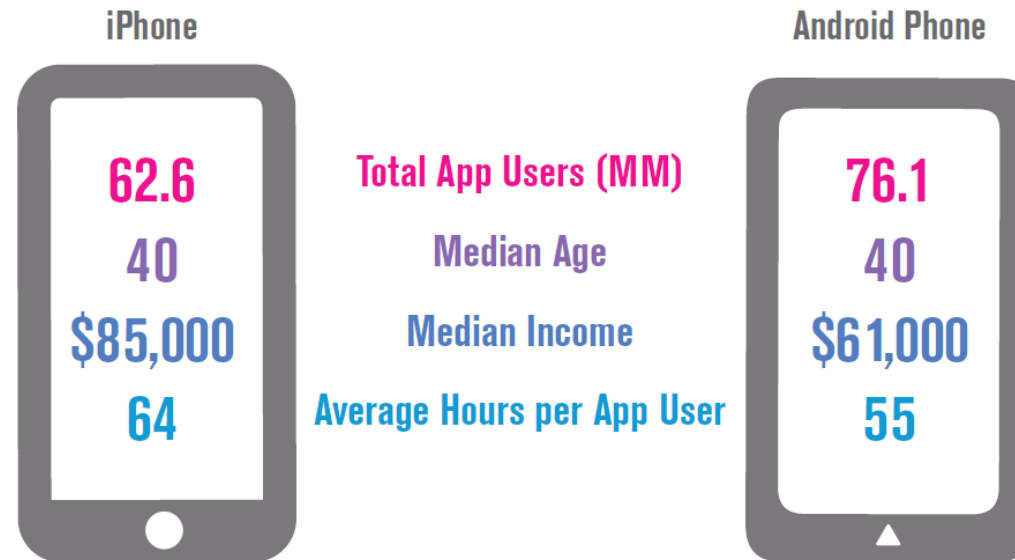
Source: comScore Custom Analytics, U.S., Age 18+, June 2014



Uso por plataforma

Top Line Platform Stats for App Usage

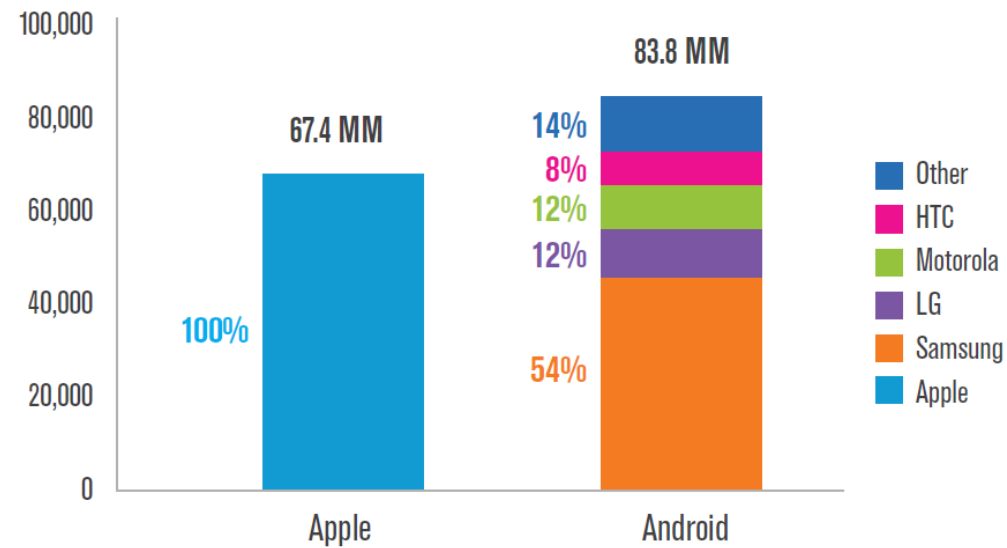
Source: comScore Mobile Metrix, U.S., Age 18+, June 2014



Uso por plataforma

Market Share of OEMs by Smartphone Platform

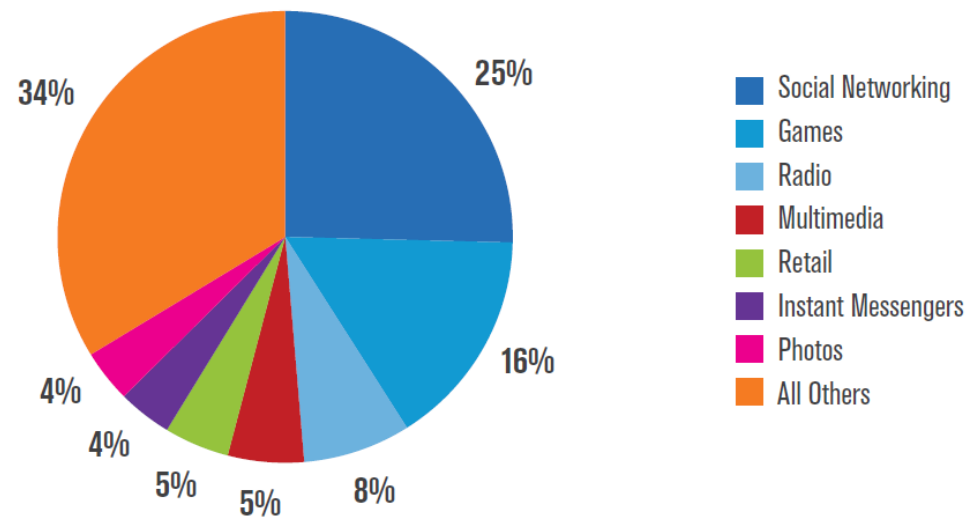
Source: comScore MobiLens, U.S., Age 18+, 3 Month Average Ending June 2014



Uso por categoria

Share of Mobile App Time Spent

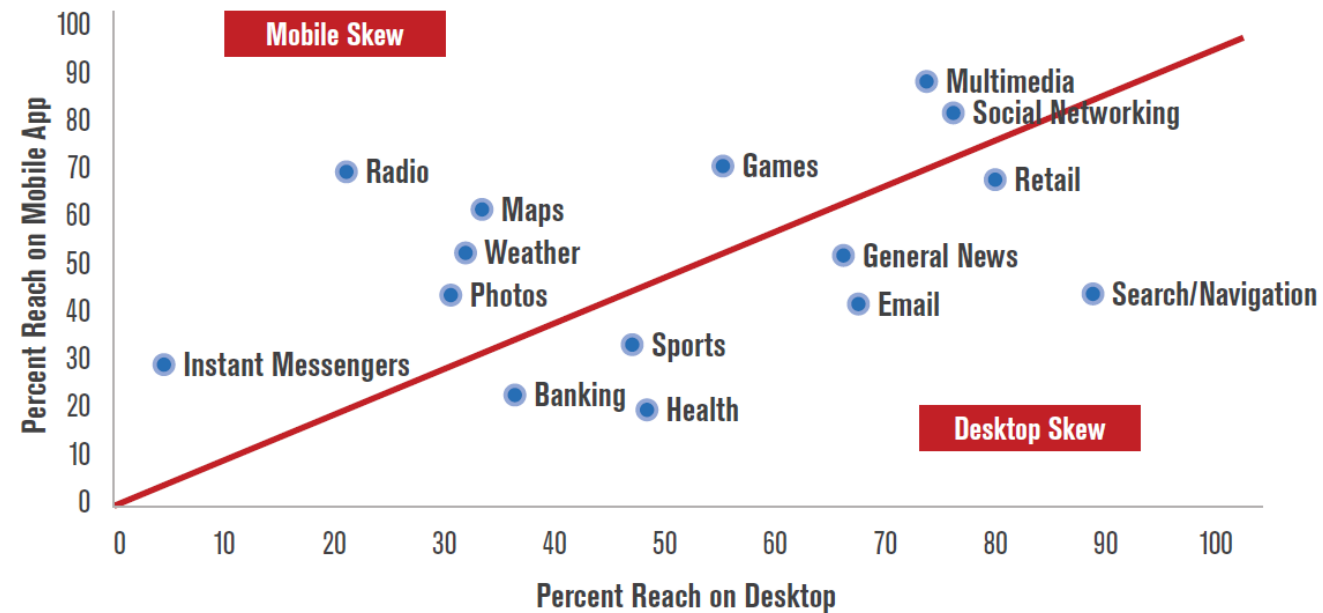
Source: comScore Mobile Metrix, U.S., Age 18+, June 2014



Uso por categoria

Percent Audience Reach on Desktop and Mobile App by Category

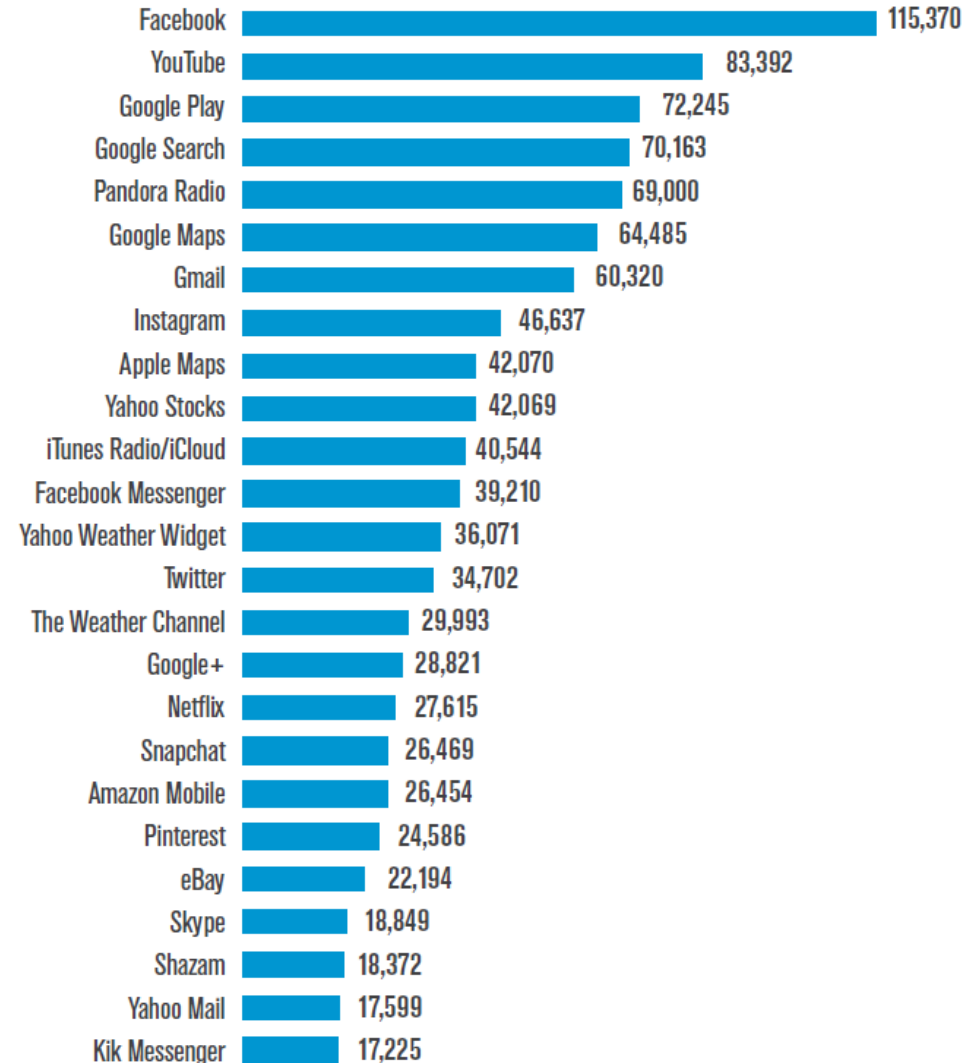
Source: comScore Media Metrix & Mobile Metrix, U.S., June 2014



Uso por categoria

Top 25 Mobile Apps by Unique Visitors (000)

Source: comScore Mobile Metrix, U.S., Age 18+, June 2014



Sistemas Operacionais de Dispositivos Móveis

- Principais sistemas operacionais que suportam o desenvolvimento de software para dispositivos móveis:

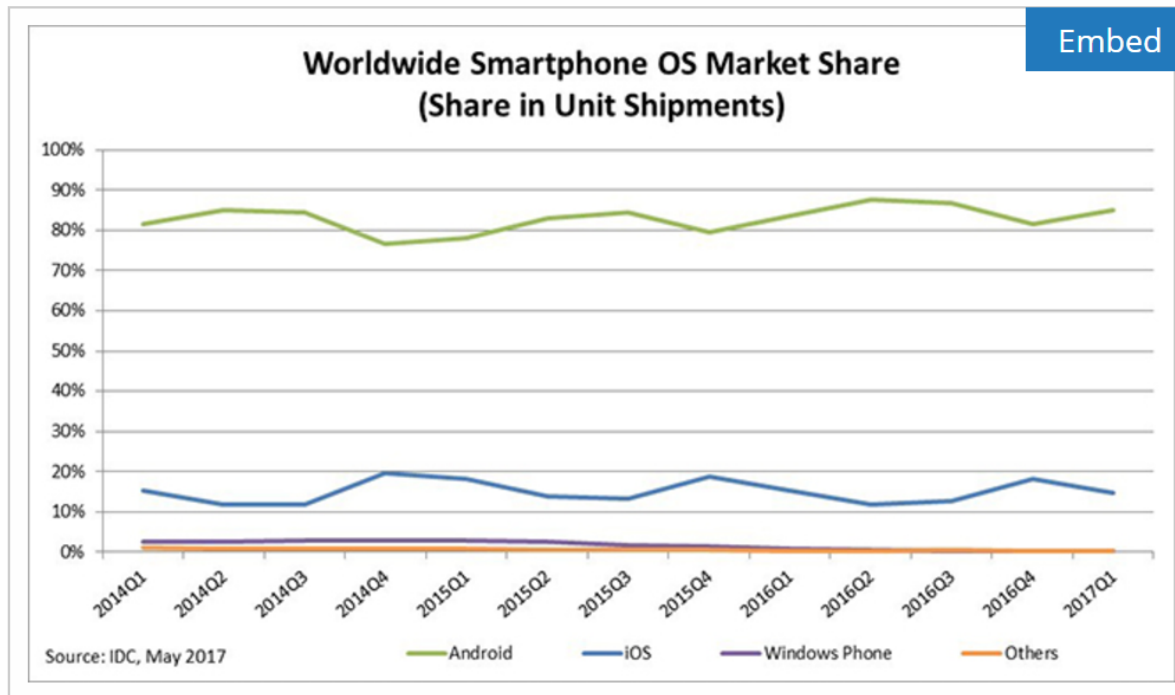
- ✓ iOS (Apple - www.apple.com/ios)

- ✓ Android (Google – developer.android.com)

- ✓ Windows Phone (Microsoft – dev.windows.com)



According to the [IDC Quarterly Mobile Phone Tracker](#), phone companies shipped a total of 344.3 million smartphones worldwide in the first quarter of 2017 (1Q17). In light of what might seem like a slowing market, consumers continue to show demand for smartphones and OEM flagship hype seems strong as ever. Worldwide smartphone shipments grew 3.4% in 1Q17 year over year, which was slightly lower than IDC's previous forecast of 3.6% growth.



Mobility Press Releases

[Worldwide Wearables Market to Nearly Double by 2021, According to IDC](#) →

[Worldwide Shipments of Augmented Reality and Virtual Reality Headsets Expected to Grow at 58% CAGR with Low-Cost Smartphone VR Devices being Short-Term Catalyst, According to IDC](#) →

[Xiaomi and Apple Tie for the Top Position as the Wearables Market Swells 17.9% During the First Quarter, According to IDC](#) →

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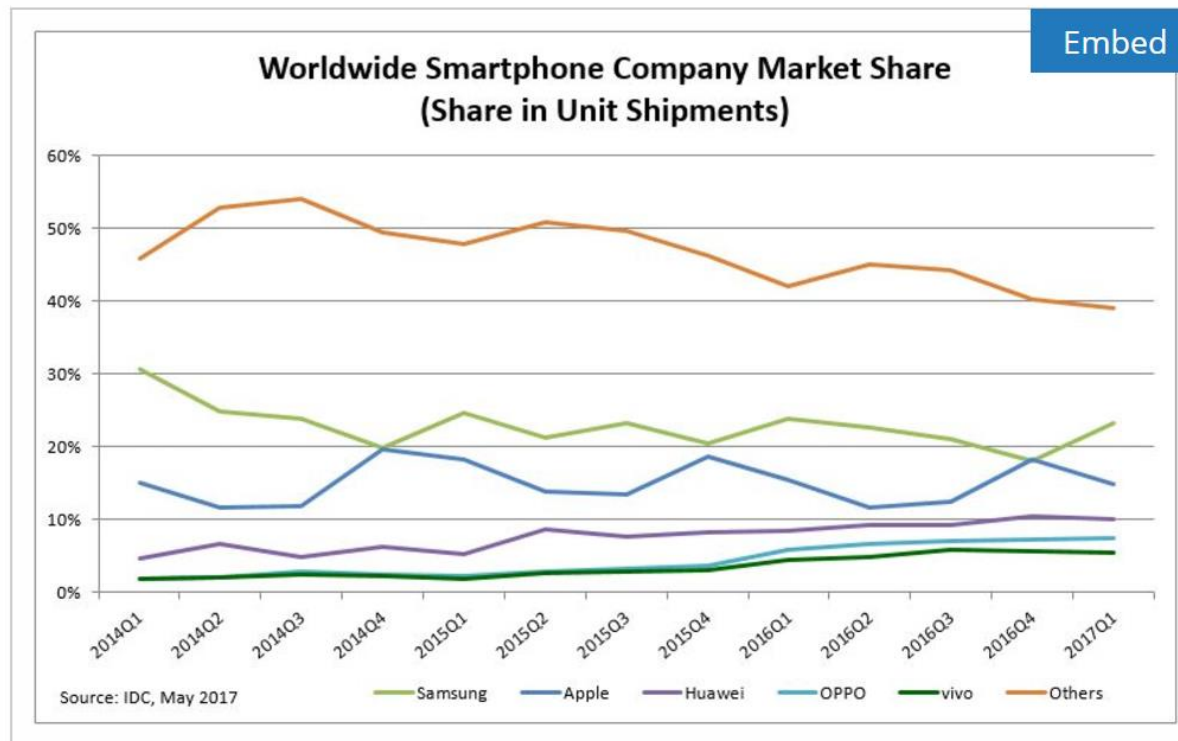
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Mobile Phone Services

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- ▶ [WW Quarterly Mobile Phone Tracker](#)

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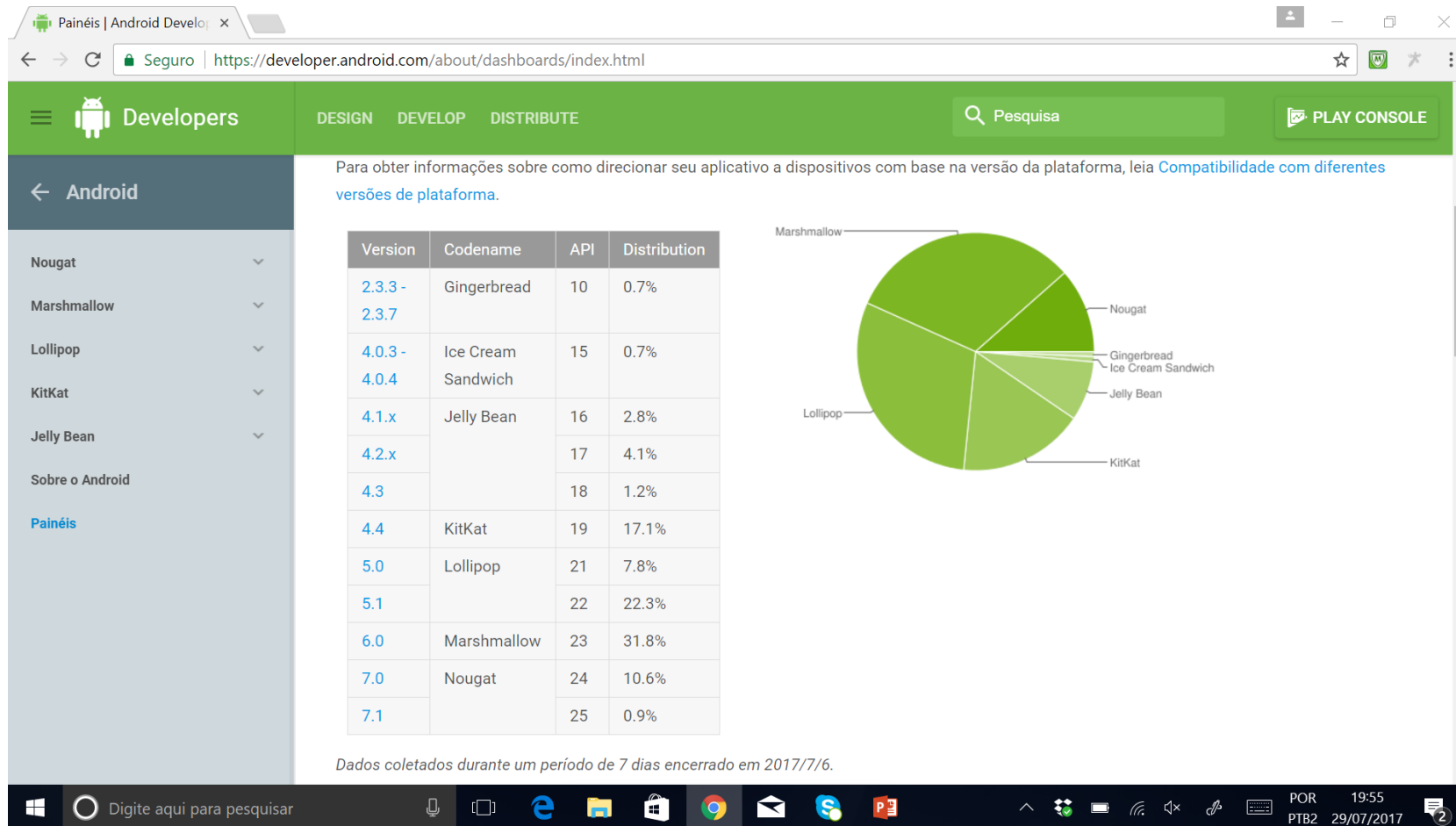
Mobile Phone Services

- ▶ [Mobile Phone](#)
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Visão geral do Android

- Sistema operacional de código aberto e gratuito.
- Desenvolvido pela Android Inc., que foi adquirida pelo Google em julho de 2005.
- Em novembro de 2007, foi formada a Open Handset Alliance.
- Os aplicativos são desenvolvidos em Java.
- Possui vários aplicativos incorporados de fábrica: telefone, contatos, correio, navegador e muito mais.
- Um pouco mais: <http://developer.android.com/about/index.html>

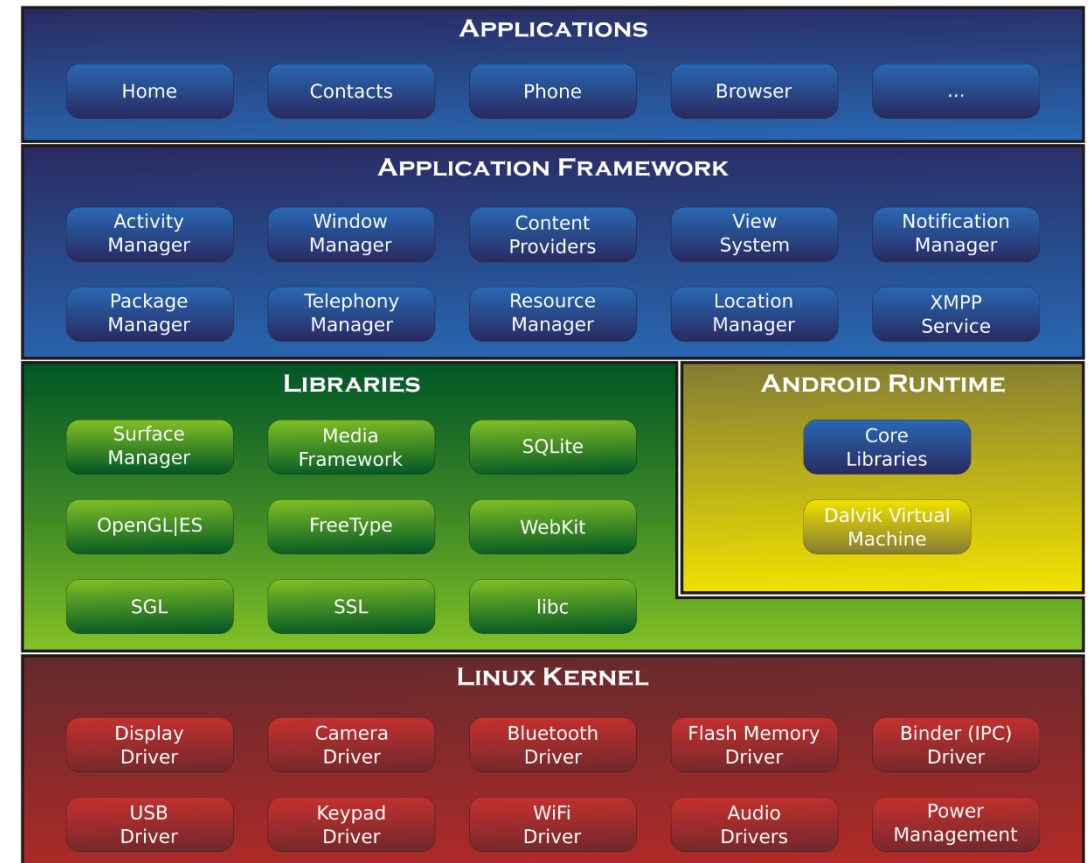
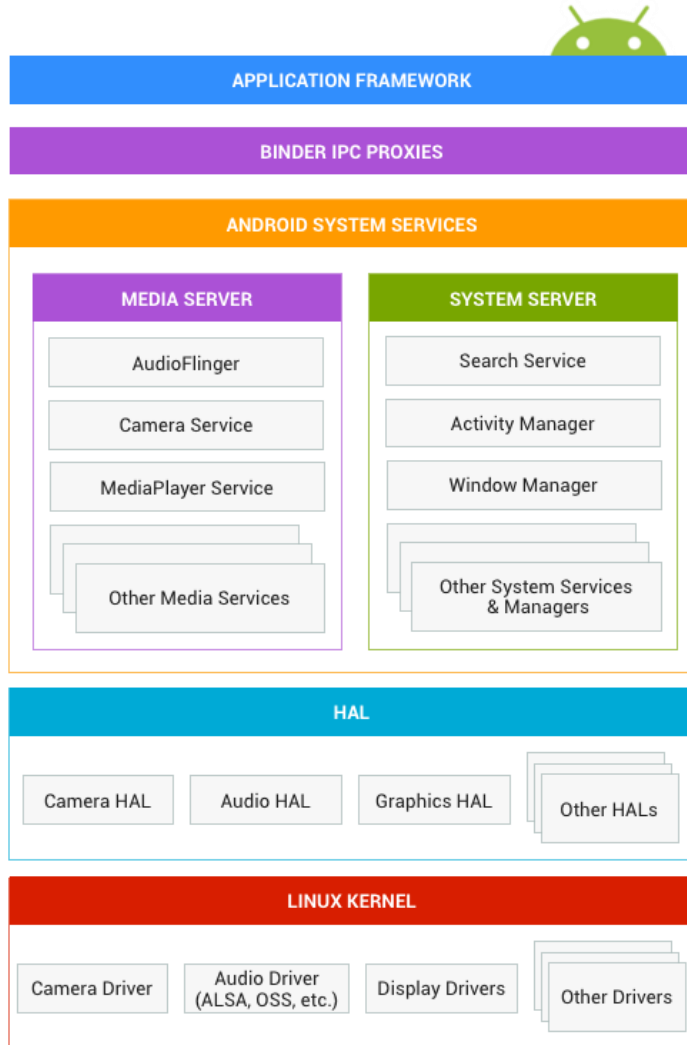
Versões do Android (ou melhor, algumas sobremesas!)



Plataforma Android

- Pilha de software multicamadas para construção e execução de aplicativos de dispositivos móveis
 - ✓ Kernel de SO, biblioteca de sistemas, frameworks de aplicações e aplicações (apps) chave
- Android SDK para criação de apps
 - ✓ Bibliotecas e ferramentas de desenvolvimento
 - ✓ Muita documentação!
 - ✓ developer.android.com/training

Arquitetura do Android



<https://source.android.com/devices/>

Linux Kernel

- Standard Services

- ✓ Security
- ✓ Memory and process management
- ✓ File & network I/O
- ✓ Device drivers

- Android-specific

- ✓ Power management
- ✓ Android shared memory
- ✓ Low memory killer
- ✓ Interprocess communication

Libraries

- System C library
 - ✓ Bionic libc
- Surface Mgr.
 - ✓ Gerenciamento de display
- Media Framework
 - ✓ Audio/Video
- Webkit
 - ✓ Browser engine
- OpenGL
 - ✓ Graphics engines
- SQLite
 - ✓ Banco de Dados Relacional

Android Runtime

- Core Java Libraries

- ✓ Classes Java Básicas -- java.*, javax.*
- ✓ App Lifecycle -- android.*
- ✓ Internet/Web Services -- org. *
- ✓ Teste unitário -- junit.*

- ART (Android Runtime) and Dalvik Virtual Machine

- ✓ Projetados para ambientes com restrição de recursos:
 - CPU lenta
 - Pouco memória
 - Bateria com tempo vida curto

Fluxo de trabalho típico

1. Aplicações são escritas em Java
2. Os fontes são compilados para arquivos *bytecodes* Java
3. Esses *bytecodes* são convertidos para um único arquivo: *classes.dex*
4. O arquivo *classes.dex* é executado pelo ART ou pela Dalvik Virtual Machine

Application Framework (1/3)

- Package Manager
 - ✓ Mantém o controle de pacotes dos aplicativos no dispositivo
- Window Manager
 - ✓ Gerencia as janelas que compreendem uma app
- View System
 - ✓ Fornece a interface para os usuários: ícones, caixas de texto, botões, etc.

Application Framework (2/3)

- Resource Manager
 - ✓ Gerencia os recursos não-compiláveis: strings, gráficos e layout de arquivos
- Activity Manager
 - ✓ Gerencia o ciclo de vida de aplicativos e a pilha de navegação
- Content Provider
 - ✓ Compartilhamento de dados entre aplicativos

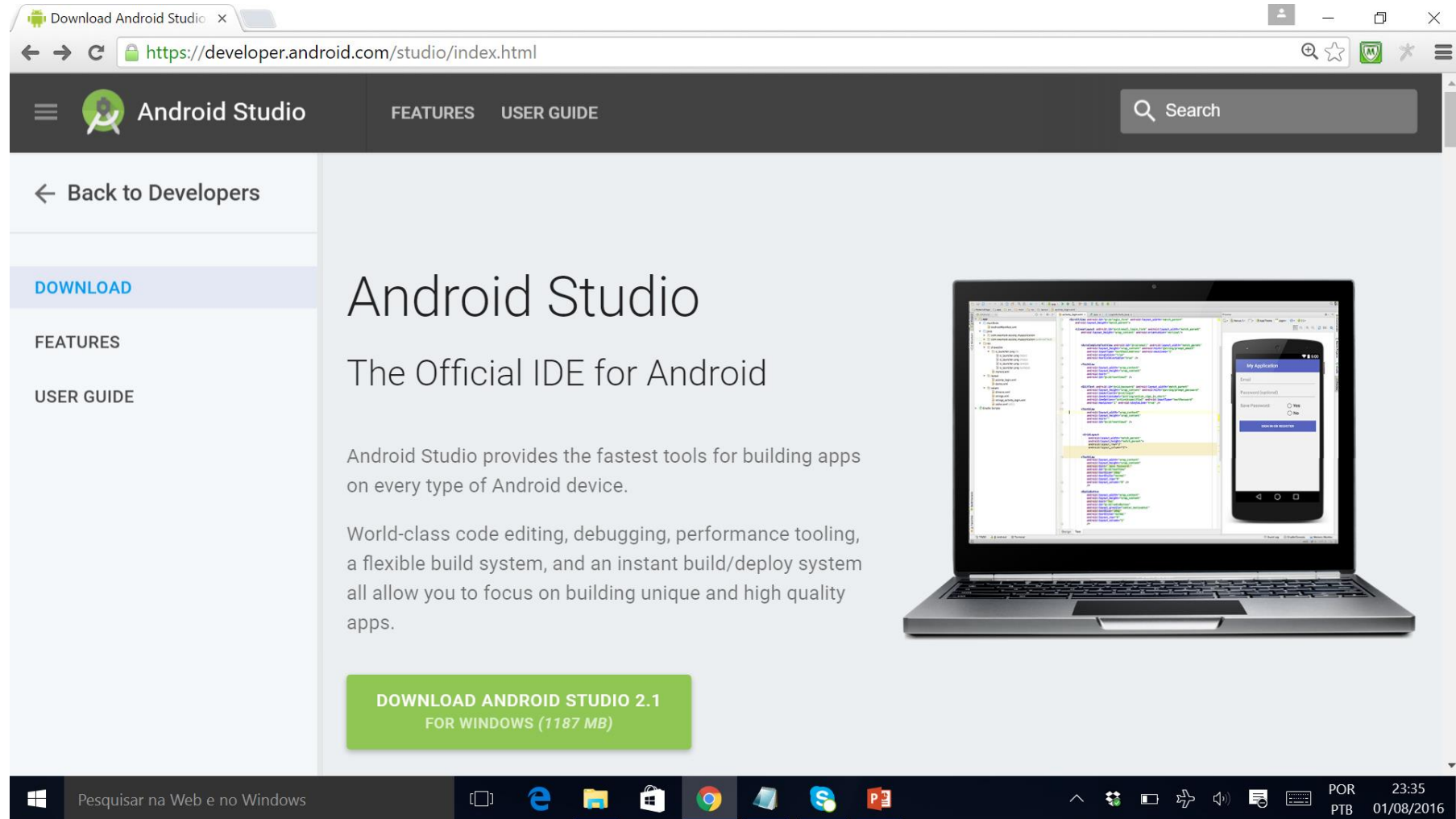
Application Framework (3/3)

- Location Manager
 - ✓ Provê informações de localização e movimento
- Notification Manager
 - ✓ Insere ícones de notificação na barra de status quando ocorre um evento importante: chamada telefônica, mensagem, ou pop-up de uma app

Ambiente de Desenvolvimento Android

- Bancada para construção de aplicações Android.
- Sistemas operacionais:
 - ✓ Windows 7/8/10 (32- or 64-bit)
 - ✓ Mac OS X 10.10 (Yosemite) or higher, up to 10.12 (Sierra)
 - ✓ Linux (tested on Ubuntu 12.04)
- 8 GB RAM (recomendável)
- Java SDK 8
- <https://developer.android.com/studio/index.html>

ADT: Android Developer Tools



AVD (Android Virtual Device)

- Prós
 - ✓ Não requer um telefone real
 - ✓ É reconfigurável
 - ✓ Mudanças são não-destrutivas
- Contras
 - ✓ Pode ser mais lento
 - ✓ Algumas funcionalidades não estão disponíveis
 - ✓ A experiência do usuário pode ser perdida



Construindo o primeiro projeto Android

- Building Your First App:
<http://developer.android.com/training/basics/firstapp/index.html>
 - ✓ Creating an Android Project
 - ✓ Running Your Application
 - ✓ Building a Simple User Interface
 - ✓ Starting Another Activity