

RAD Studio

The Connected App Platform
for Windows and Beyond

**IoT em Ação:
Criando um Moderno
Sistema para Hospitais**

Apresentação

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- FB: <http://fb.com/DelphiBrasil>

Agenda

- RAD Studio XE8
- App Posto de Enfermagem
 - Visão Geral
 - Arquitetura
 - Tecnologias Utilizadas
- Posto de Enfermagem: Demo
- Resumo, Perguntas e Respostas



RAD Studio XE8

Industrial strength, business ready
connected app development.



RAD Studio XE8

O que é o RAD Studio?



Uma Plataforma para Apps
Conectadas para Windows e além



Desenvolvimento RAD para
Windows, Mac, iOS, e Android e IoT



Soluções de nível industrial e
prontas para os negócios do futuro

RAD Studio XE8: Pronto para Corporações

Construa soluções de nível industrial e prontas para os negócios do futuro



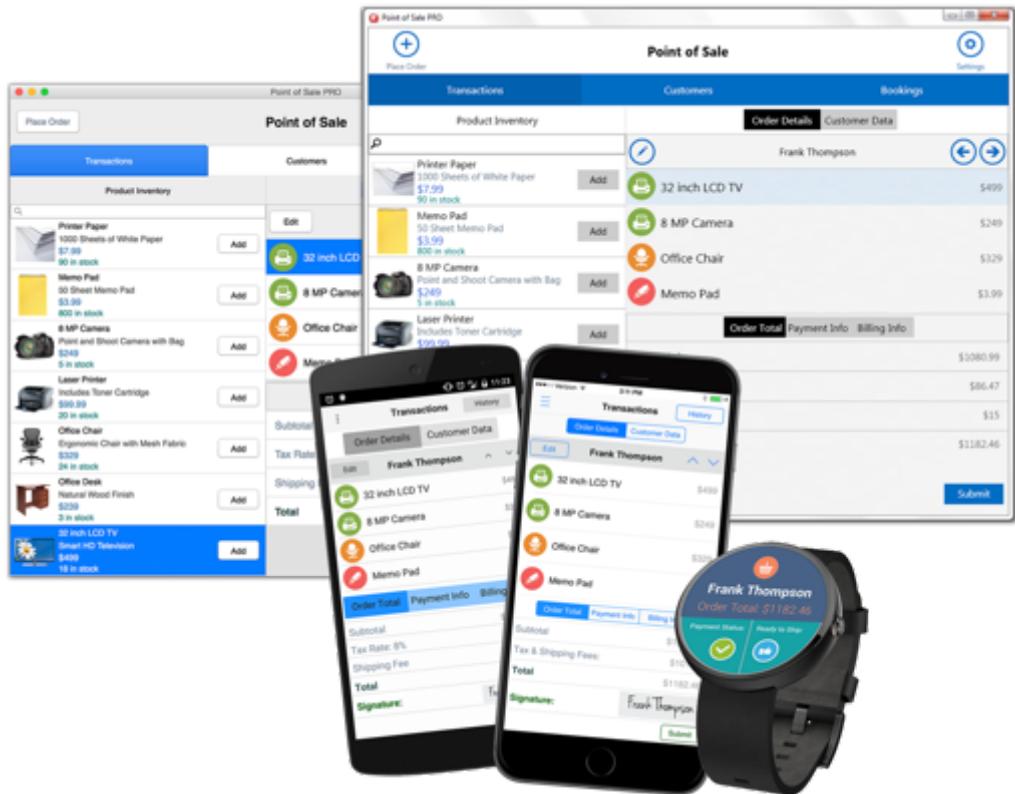
RAD Studio XE8: Conectado

Conecte clientes nativos,
extensões mobile,
dispositivos inteligentes,
serviços nas nuvens,
dados corporativos e
embutidos.



RAD Studio XE8: Multi-device

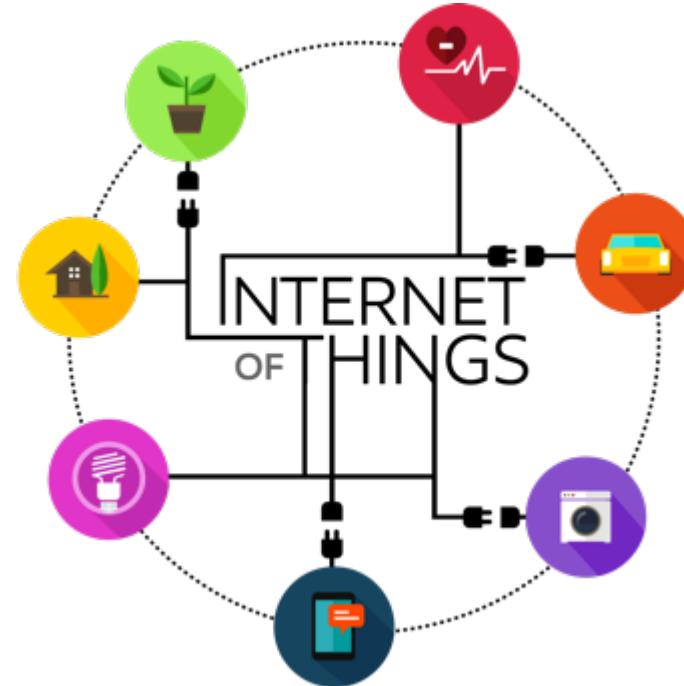
Entregue aplicações
em múltiplas
plataformas com um
único código-fonte
através do FireUI



RAD Studio XE8: Pronto para IoT

Estenda aplicações com as novas capacidades de IoT:

- Detecção de proximidade
- Informações de dispositivos
- Coleta de dados de sensores

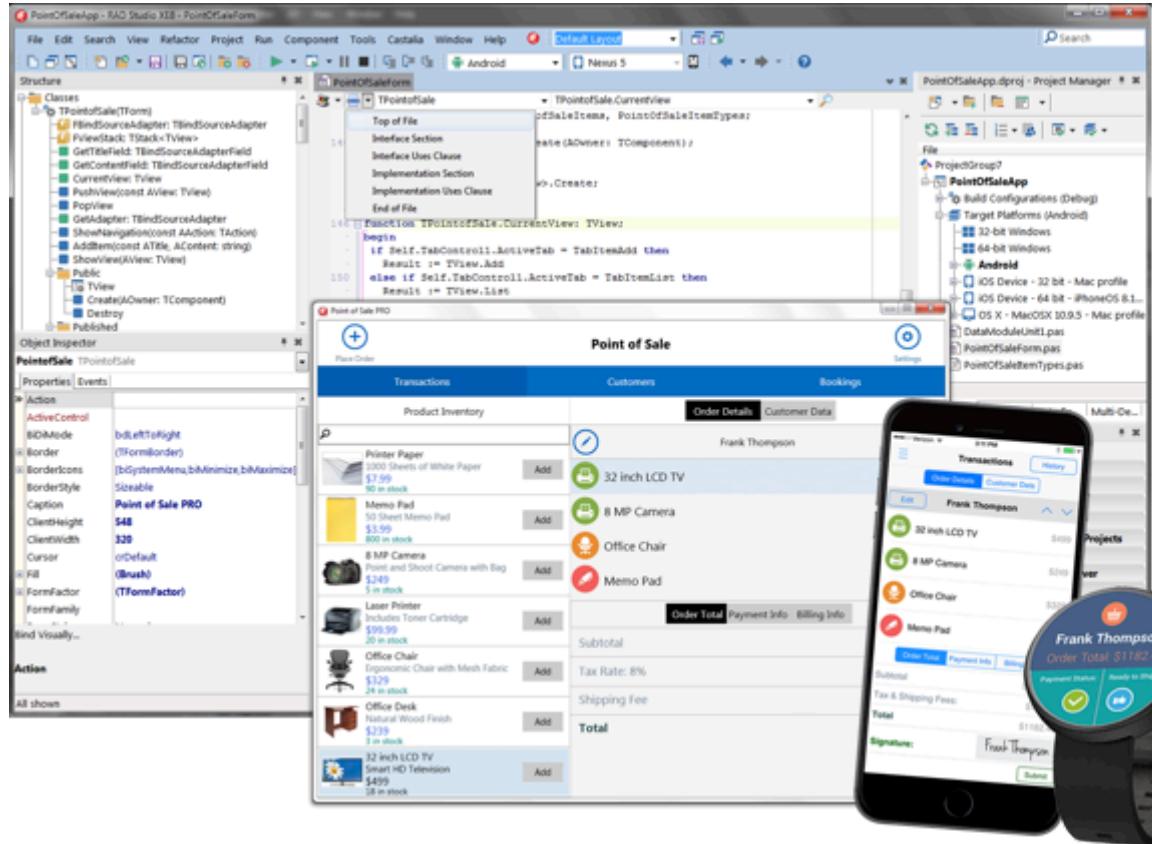


RAD Studio XE8: EMS Middleware

Acesso e sincronização de dados corporativos e
publicação de APIs customizadas REST com o
Enterprise Mobility Services



RAD Studio XE8: Para Desenvolvedores!



RAD Studio XE8

Industrial strength, business ready
connected app development.

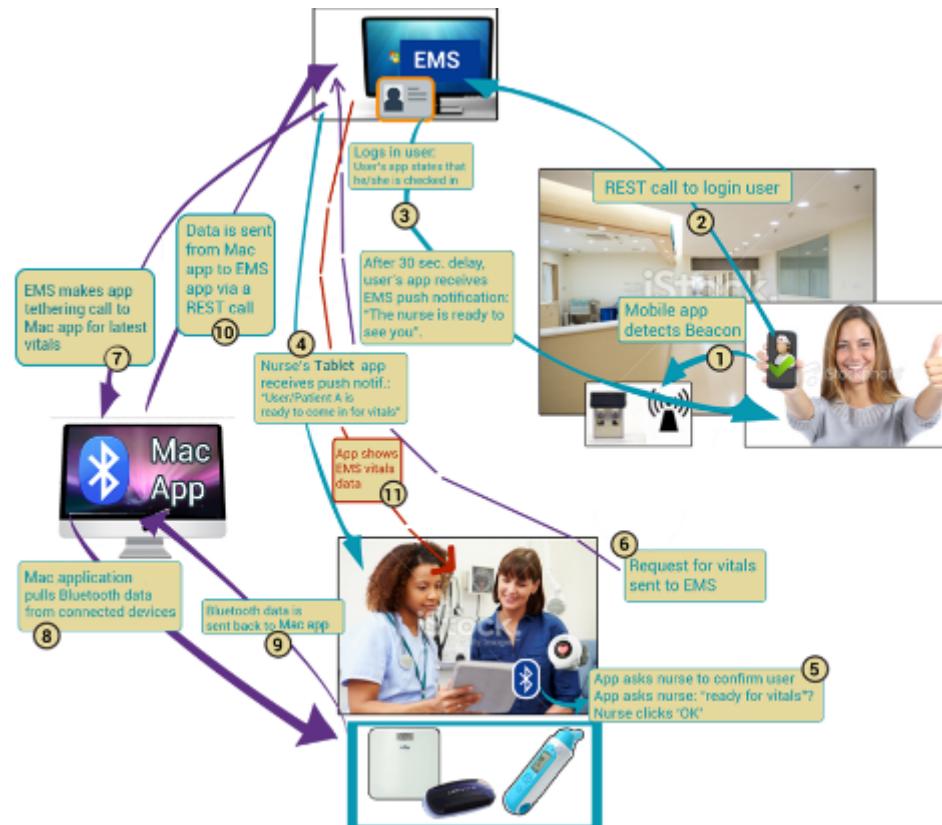
**Posto de
Enfermagem:
Visão Geral**



Posto de Enfermagem

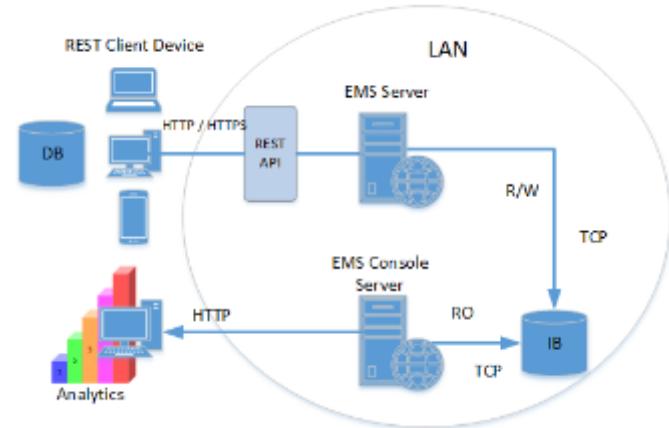
- Cenário de um consultório médico utilizando RAD Studio XE8
- EMS *endpoints* customizados para login, notificações push, consultas e mais
- Paciente faz check-in via seu smartphone ao chegar ao consultório
- Realizado o check-in, enfermeira recebe uma notificação push EMS
- O paciente recebe uma notificação push EMS quando enfermeira disponível
- *Beacons* são utilizados para notificação de proximidade
 - Quando o paciente chega na sala de espera
 - Quando o paciente chega ao posto de enfermagem
- App no tablet da enfermeira utiliza Bluetooth LE para capturar dados vitais
- Dados vitais são armazenados no EMS utilizando uma base Interbase

Posto de Enfermagem – Fluxo de Dados



Posto de Enfermagem - Arquitetura

- Integração das Apps via EMS
 - FireMonkey, mobile, VCL
 - Push notifications, AppAnalytics
- Internet das Coisas (IoT)
 - Integração de Devices via BluetoothLE
 - Heart Rate Monitor
 - Weight Scale
 - Beacons



Detalhes Técnicos dos Beacons

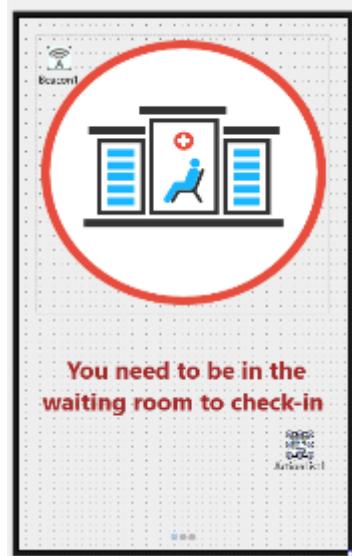
- Beacon #1: Localizado na sala de espera
 - Paciente caminha próximo ao *beacon* com a app executando
 - App detecta o *beacon* e mostra mensagem solicitando check-in
 - Paciente efetua o *login* usando credenciais existentes no EMS
 - Enfermeira recebe uma notificação *push* via EMS em seu *tablet*
 - Enfermeira confirma que o paciente pode ser atendido
 - Paciente recebe uma notificação *push* de que a enfermeira está disponível.

Detalhes Técnicos dos Beacons

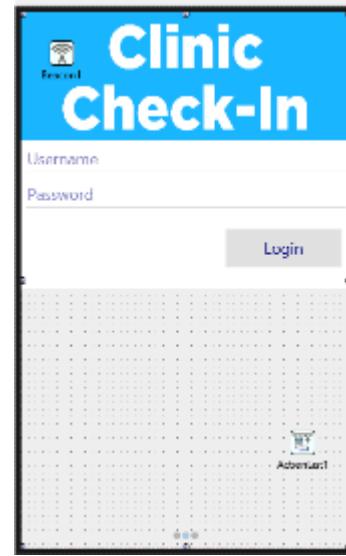
- Beacon #2: Localizado na sala de triagem
 - Detecta o usuário e atualiza app da enfermeira com o paciente
 - App da enfermeira verifica o nome do paciente e se conecta ao leitor de batimentos cardíacos via BluetoothLE (também é possível se conectar a balanças Bluetooth e etc.)
 - Dados resultantes são armazenados em uma base de dados Interbase

Posto de Enfermagem: App do Paciente

Welcome



Patient Login



Patient Beacon Check-In



Posto de Enfermagem: App da Enfermeira

GetData

Record Patient Vitals

Patient Name	<input type="text"/>
Patient Heartrate	<input type="button" value="Connect to Device"/> <input type="text" value="Current Patient Heartrate"/> <input type="button" value="SaveData"/>
Patient Weight	<input type="button" value="Connect to Device"/> <input type="text" value="Current Patient Weight"/> <input type="button" value="SaveData"/>

 BindingsList1

StoredData

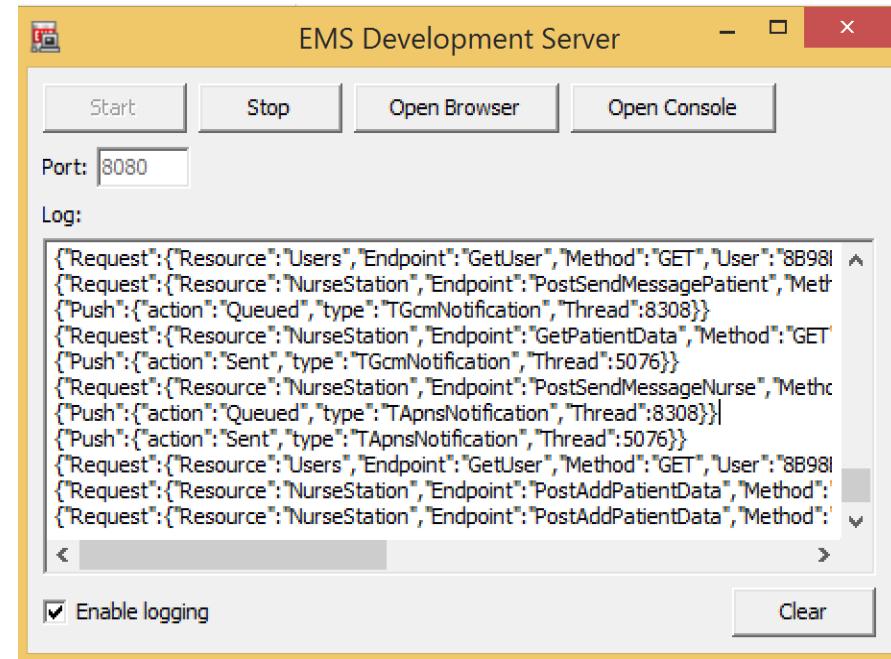
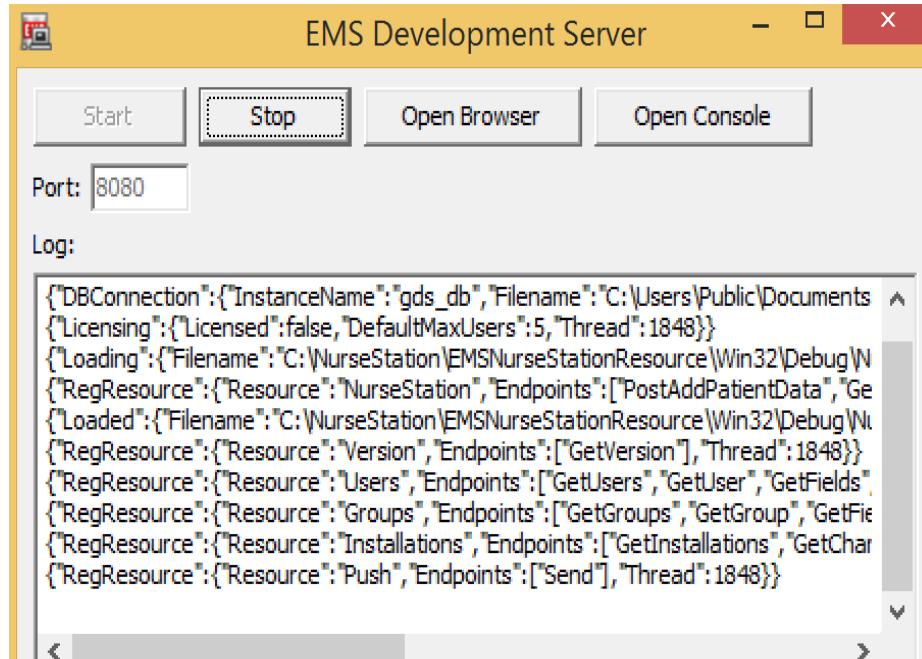
Stored Patient Vitals

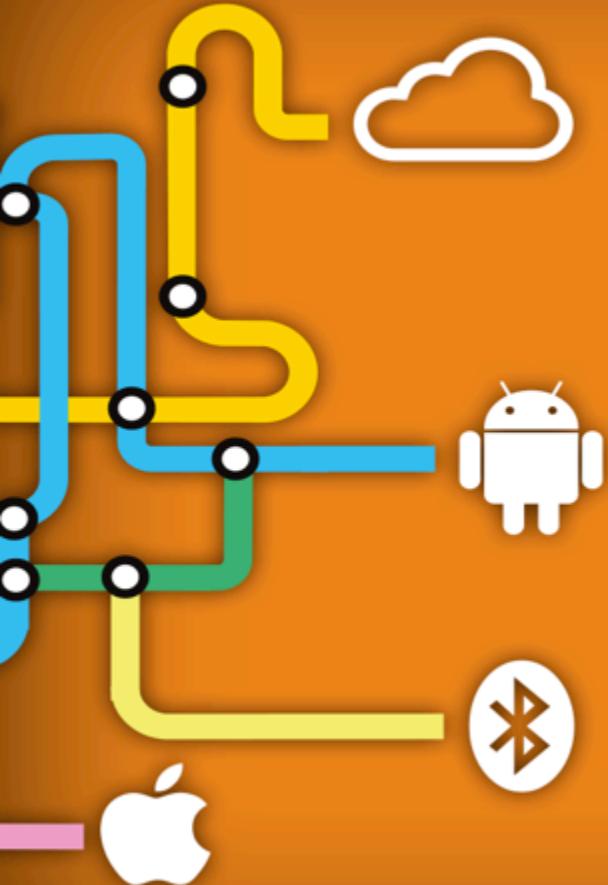
RECORDED PATIENT VITALS

Patient Name	
Stored Patient Heartrate	0
Stored Patient Weight	0

 BindingsList1

EMS Server





RAD Studio

The Connected App Platform
for Windows and Beyond

EMS no RAD Studio

Conectando mobile, desktop e IoT

O Que é EMS?

Enterprise Mobility Services

Um servidor middleware pronto para uso:



- Gerenciamento de Usuários e Autenticação
- Módulos carregáveis para APIs em REST
- Acesso a banco de dados corporativos
- Armazenamento de dados no servidor e embutido
- Console web para usuários, dispositivos e API Analytics

Por que EMS?

- Soluções mobile empresariais requerem um *backend* robusto
- Solução completa, preparada para Cloud, rápida e de fácil distribuição
- Peça fundamental de uma solução corporativa
- Ou clientes compartilhados suportados por um VAR



EMS como um serviço privado nas núvens



EMS é Multi-Tier

- Clientes EMS utilizam API REST e BD local seguro
- Servidor EMS hospeda packages plug-in e utiliza o BD EMS
- Packages EMS comunicam com BD corporativos e dados nas nuvens (cloud)



EMS Analytics

The screenshot shows a web-based analytics interface for API endpoint usage. The main title is "API Calls EndPoint Analytics". On the left, a sidebar menu includes Home, Users, Groups, Installations, and Analytics. Under Analytics, there are several options: Total Clients, API Calls, API Calls EndPoint, User API Calls, and Users Total Calls. A legend on the left side lists various API endpoints with corresponding colored squares: Groups - AddGroup (light red), Installations - AddInstallation (light green), Users - DeleteUser (light blue), Installations - GetChannels (light teal), Groups - UpdateGroup (light brown), Installations - GetFields (pink), Installations - GetInstallations (yellow), Installations - Send (orange), SignUpUser (dark red), GetFields (green), GetVersion (black), AddUser (dark blue), GetUsers (dark teal), Apps - GetGroups (dark brown), Groups - GetFields (dark pink), and Users - GetUsers (dark grey). Below the legend is a line chart titled "March 17, 2015" showing the volume of calls over time. The Y-axis ranges from 0 to 25, and the X-axis shows hours from 0600 to 1300. The chart displays several peaks, with the highest peak reaching 20 calls at approximately 11:00. To the right of the chart is a smartphone displaying a task management application. The app shows a task titled "Tasks ToGo Launch Banners updated" with a due date of 5:14 TUE MARCH 17. It includes fields for Task Title (Product Launch Web Banners), Task Description (480x80 Full Banner in Red and Green, 720x99 Leaderboard Banner in Blue and Yellow, 300x250 Square Banner in Red and Green), Task created by (Tim Miller), Task assigned to (Lisa Foster), and a notification message: "Please work on this task right away." A circular icon with a checkmark is visible at the bottom right of the phone screen.

API Calls EndPoint Analytics

Latest statistics

Export to CSV File All Resources

03/17/2015

API Calls EndPoint: Daily Monthly Yearly

March 17, 2015

Installations

Push - Send

Users - Signup

Groups - Get

API Endpoint	Count
Groups - AddGroup	0
Installations - AddInstallation	0
Users - DeleteUser	0
Installations - GetChannels	0
Groups - UpdateGroup	0
Installations - GetFields	18
Installations - GetInstallations	12
Installations - Send	7
SignUpUser	0
GetFields	4
GetVersion	0
AddUser	0
GetUsers	0
Apps - GetGroups	0
Groups - GetFields	0
Users - GetUsers	0

5:14 TUE MARCH 17 Tasks ToGo Launch Banners updated

Task Details

Task Title Product Launch Web Banners

Task Description 480x80 Full Banner in Red and Green, 720x99 Leaderboard Banner in Blue and Yellow, 300x250 Square Banner in Red and Green

Task created by Tim Miller

Task assigned to Lisa Foster

Notify assignee when task is late

Please work on this task right away.

Notification Message

Send Message

consoleuser

EMS na Prática

- Utilize o RAD Studio para construir
 - Módulos Server
 - Clientes Mobile/Desktop
- Hospedagem própria
 - Cloud dedicado ou servidor tradicional
- Licenças
 - Custo por usuário, apps e chamadas ilimitadas (e push notification...)



Novas Features no EMS para XE8

- Notificações Push Integrada
- Suporte para Credenciais Externas
 - Demo mostrando integração com ActiveDirectory
- Pooling de conexão com banco de dados
- Exportação de dados do Web Console
 - Dados analíticos de usuários/grupos otimizados
- Console cliente para gerenciar contas de usuário

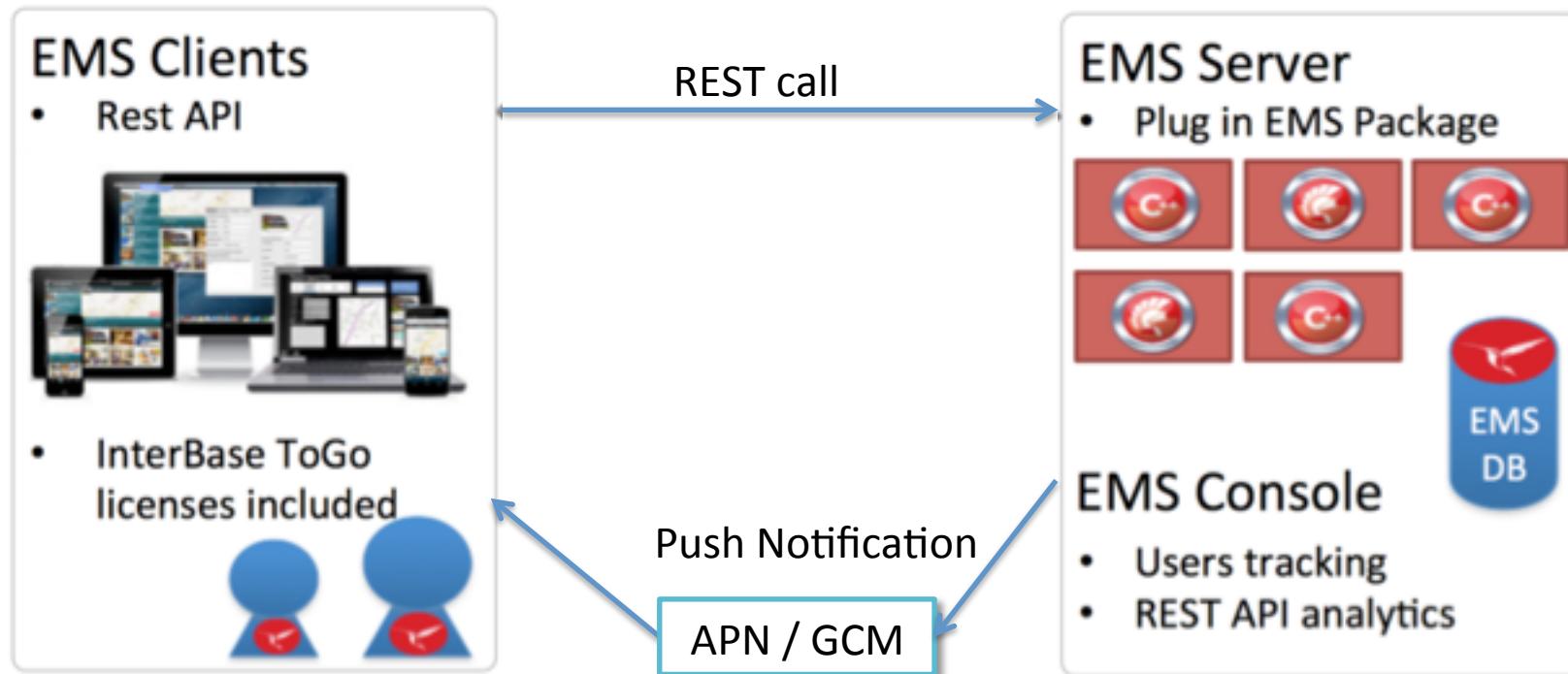
O Que são Notificações Push?

- Mecanismo para enviar notificações para dispositivos mobile
 - App no mobile precisa se inscrever e autorizar
 - Pode receber notificações enquanto a App não está executando
- Provedores
 - Android: Google Cloud Messaging (GCM)
 - iOS: Apple Push Notification (APN)

Push no RAD Studio

- Permissão para receber Push Notifications
 - Android: Permissão da App
 - iOS: Arquivo *Entitlement*
- BaaS
 - Parse, Kinvey, (App42)
- EMS
 - Direto, suporte integrado
 - Notificações baseadas em Broadcast e Subscrição

EMS e Push



EMS

Push

Manage EMS Users and Groups data and send push notifications to registered devices on your EMS Server

The screenshot displays the EMS Push application interface. It consists of two main windows:

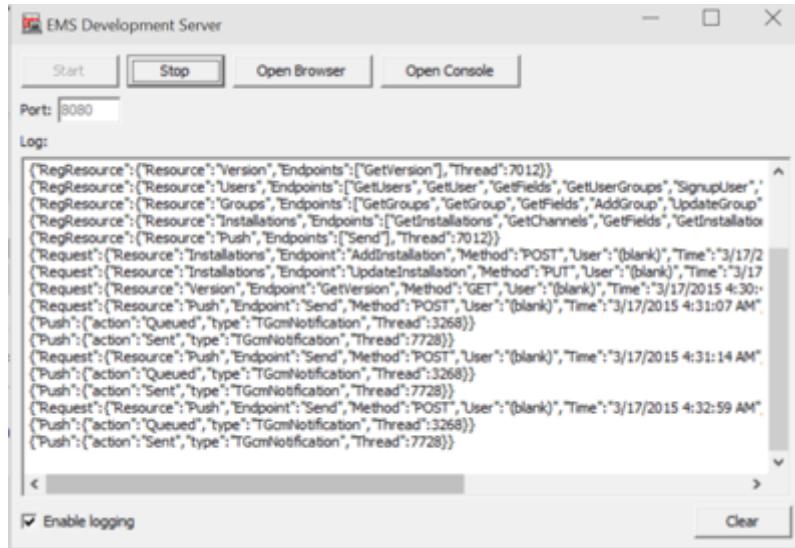
- Top Window:** A "Console" window titled "MyEMSProfile". It has tabs for Connection, Proxy, Keys, and Authenticate. Under Connection, the Host is set to "localhost", Port is "8080", and the HTTPS checkbox is unchecked. The URL Path field is empty. Below this is a "Test Connection" button. The main area shows a table of users with columns for username and _id. The users listed are Michael Miller (75D38841-8F0F...), Lisa Smithson (A0B292C4-CF1E...), Timothy Clarks (0C91080F-A5F9...), Brian Anderson (2AC928D8-7F11...), and Frank Mitchell (58650777-D530...).
- Bottom Window:** Another "Console" window titled "MyEMSProfile". This window has tabs for Connection, Proxy, Keys, Authenticate, Users, Groups, Installations, and Push. The Push tab is selected. It contains fields for Data (containing JSON: {"message": "Push Message sent via EMS"}) and Target (containing a complex JSON structure for deviceToken targeting). Below these are buttons for Data..., Channels..., Where..., and Send. At the bottom is a "Send History" panel showing the message "1:31:32 PM, Message: " - Message: 'Push Message sent via EMS' - APS.Alert: " - GCM.Message: 'Push Message sent via EMS'".

A large black arrow points from the right side of the top window towards the right edge of the slide, indicating the direction of the tool palette.

Tool Palette: A vertical list of components under the EMS provider:

- TBackendStorage
- TBackendQuery
- TBackendPush
- TPushEvents
- TBackendUsers
- TBackendFiles
- TBackendEndpoint
- TBackendAuth
- TBackendGroups
- EMS TEMSProvider** (highlighted in purple)

EMS Push Demo



Google Developers Console

Projects



MatchResults

Overview

Permissions

Billing & settings

APIs & auth

APIs

Credentials

Consent screen

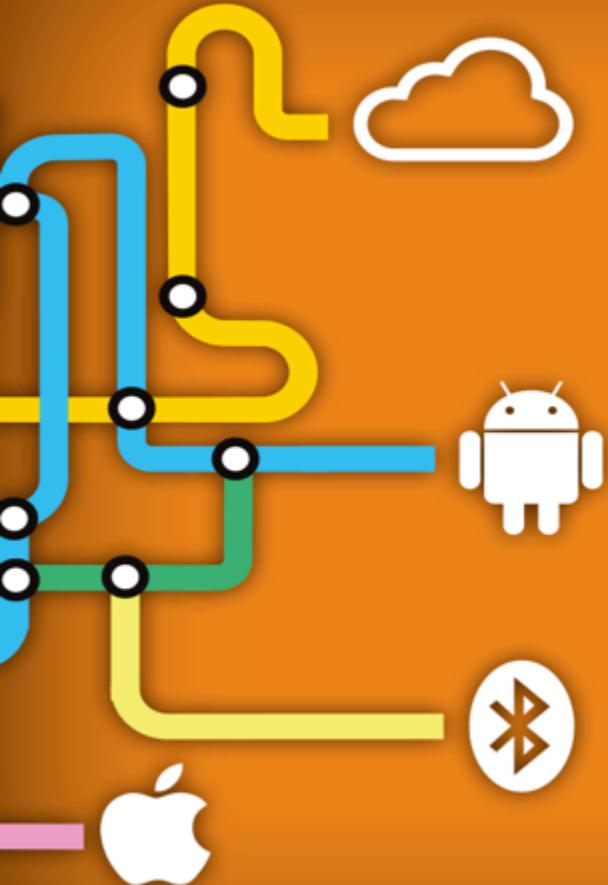
Push

Monitoring

Source Code

Compute





RAD Studio

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Bluetooth e Bluetooth LE

Conectando mobile, desktop e IoT

Aplicações para Bluetooth

- Conecte-se com Bluetooth e Bluetooth LE, dispositivos como sensores de saúde e Wearables habilitados para criar soluções únicas e de domínio específicos
- Ampliar apps VCL existentes com apps Mobile complementares ou dispositivos Bluetooth simplesmente adicionando alguns componentes

Tecnologías Bluetooth

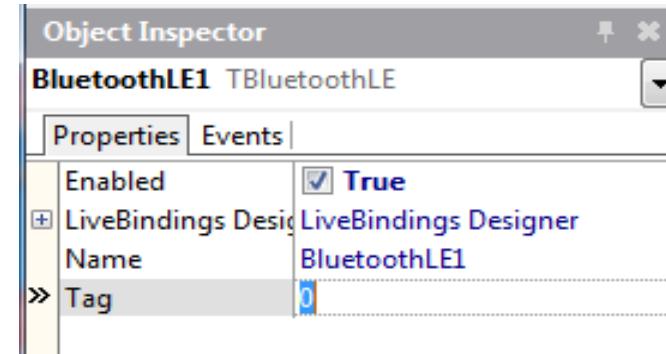
	“Classic” Bluetooth	Bluetooth LE “Low Energy”
Power Consumption	High	Low
Data transfer rate	High (2 Mbps)	Low (< 100kbps)
Number of slaves	Up to 7	Large number
Profiles	Standard (SPP, DUN, PAN)	Generic Attribute Profile
Common usage Scenario	Cars, headphones, hands free devices, mobile phones	Health devices, smart watches, wearables, gadgets

Suporte Bluetooth X Plataformas

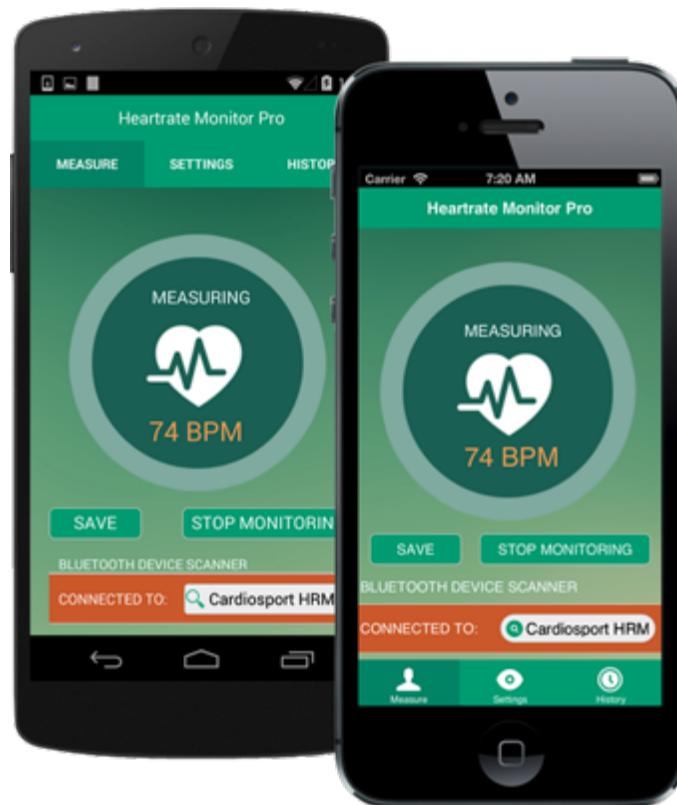
	“Classic” Bluetooth	Bluetooth LE “Low Energy”
Android	✓	✓ (only from Android 4.3)
iOS	✗	✓ (iPhone 4s+ and iPad2+)
Windows	✓	Only in Windows 8
Mac	✓	✓

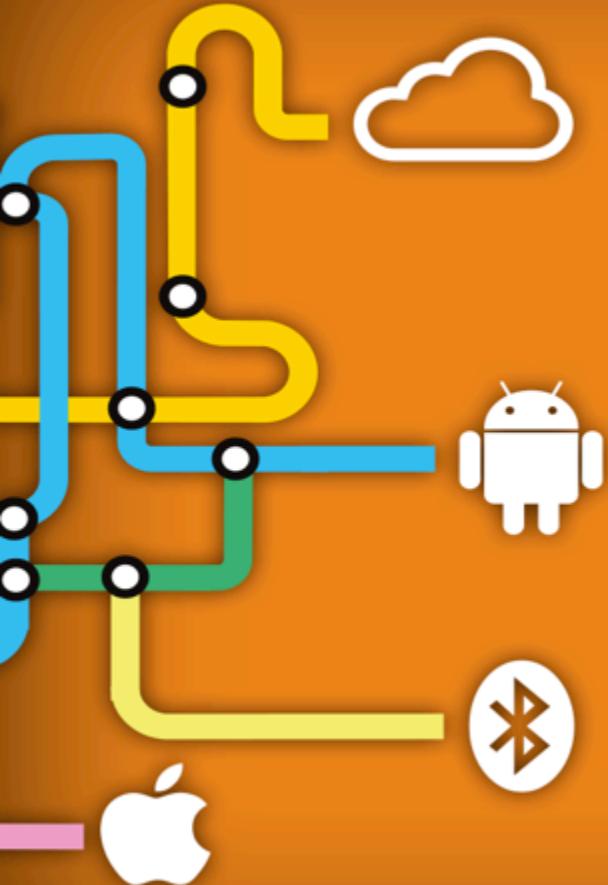
Suporte Bluetooth no RAD Studio

- Inclui APIs Bluetooth e Bluetooth LE
 - Suporte a API nativa pode ser usada diretamente pelo desenvolvedor
- Extensão Bluetooth para App Tethering
 - Interface “Fácil de usar, suporte *cross platform*
- Novos componentes Bluetooth LE e Bluetooth Standard



Demos Bluetooth LE





RAD Studio

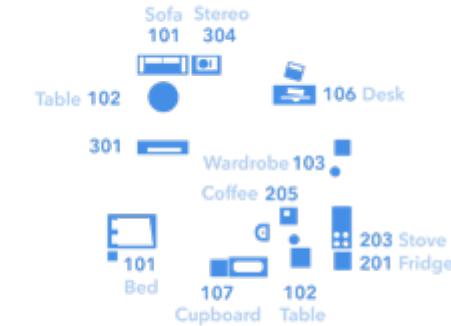
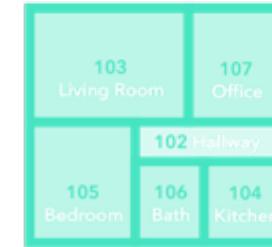
The Connected App Platform
for Windows and Beyond

Proximidade com Beacons

Conectando mobile, desktop e IoT

O que faz um Beacon?

- Um Beacon fornece proximidade e identificação
 - Informa uma App sobre o quanto perto está (força do sinal)
 - Fornece identificação (UUID, Major ID & Minor ID)
- Dois principais standars
 - iBeacons (Apple)
 - AltBeacons



UUID Major ID Minor ID

AA6062F0-98CA-4211-8EC4-193EB73CEBE6

O que você pode fazer com um Beacon?

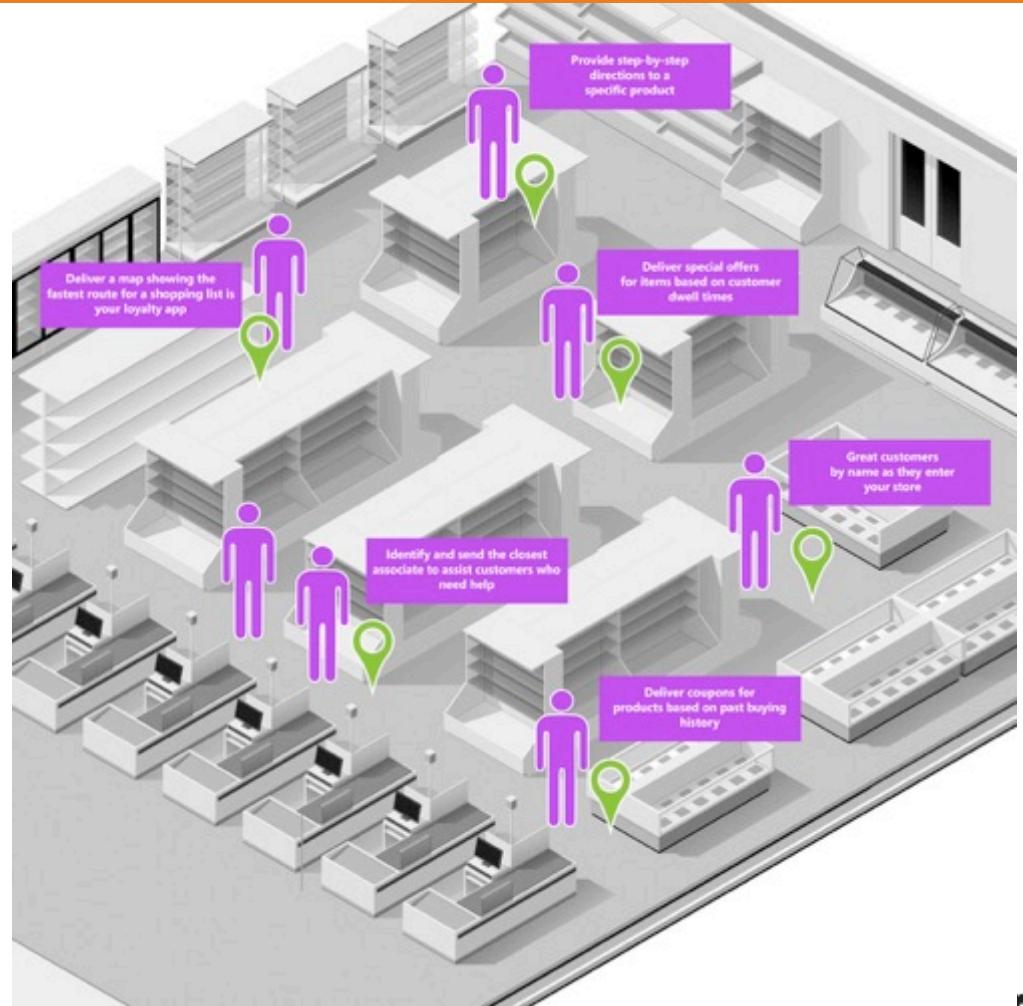
- Sua aplicação de “proximidade” pode:
 - Encontrar Beacons próximos
 - Determinar o quanto perto você está do Beacon
 - Conhecer a Identidade do Beacon
 - UUID, Major, Minor
 - Entrar/Sair da Área de um Beacon
 - Limitado ao sinal do BLE
 - Tomar uma ação baseado no fato de “ver” o Beacon



Caso de Uso: Lojas em Geral

THE MPACT ADVANTAGE

- MORE SAVINGS FOR YOUR SHOPPERS
- BIGGER BASKETS
- MORE REVENUE
- A BETTER SHOPPING EXPERIENCE
- MORE RETURN VISITS
- INCREASED LOYALTY



O Componente TBeacon

Object Inspector

Beacon1 TBeacon

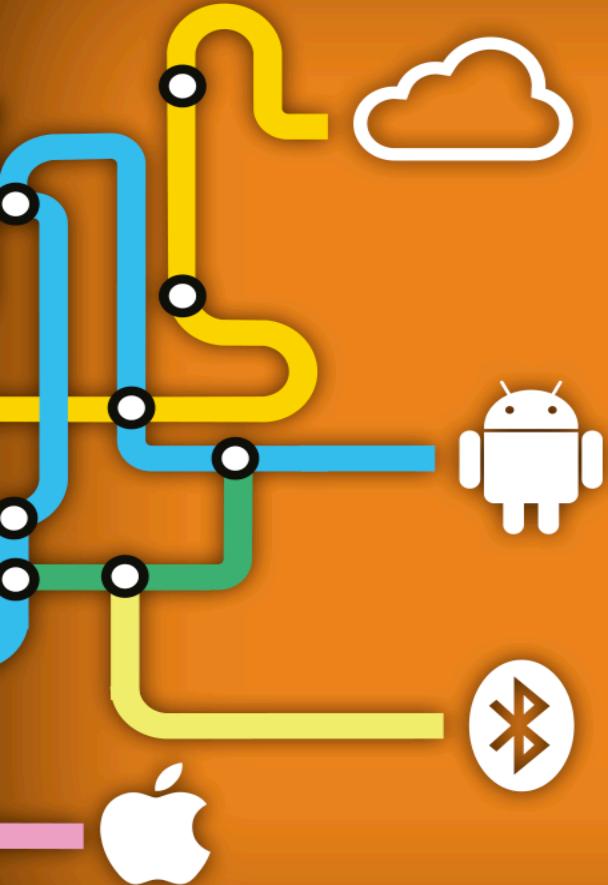
Properties Events

» BeaconDeathTime	5
CalcMode	Stabilized
Enabled	<input type="checkbox"/> False
+ LiveBindings Designer	LiveBindings Designer
Mode	Alternative
MonitoredRegions	(TBeaconRegionCollection)
Name	Beacon1
ScanningSleepingTime	250
ScanningTime	500
SPC	0.5
Tag	0



Beacon1

- Suporta iOS, Android, e OSX
- Padrões *iBeacons* e *AltBeacons*
- Usa eventos para receber informação



RAD Studio

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for Windows and Beyond

Posto de Enfermagem: Tecnologia Utilizada

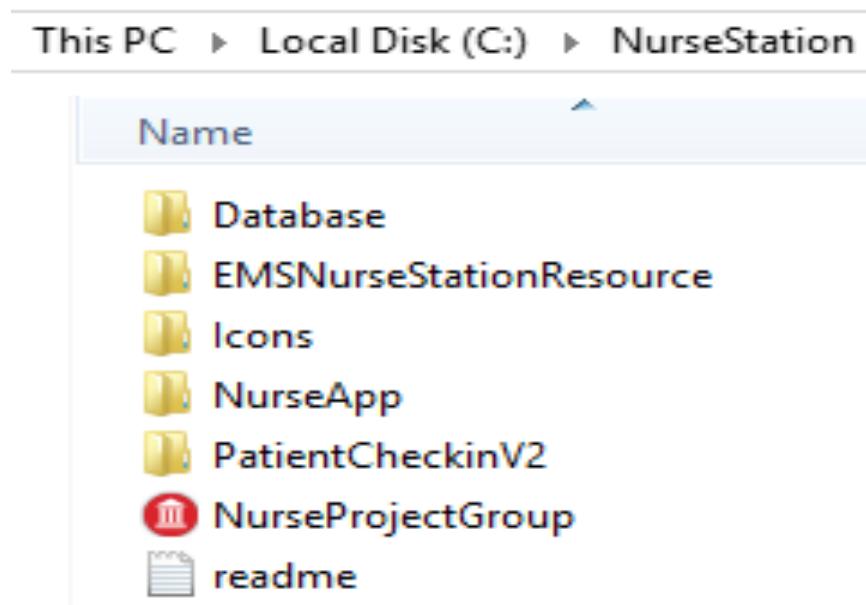
Posto de Enfermagem: Tecnologias Utilizadas XE8

- FireUI: multi-device UI for Windows, OS X, iOS, Android
- VCL for Windows
- FireDAC database access
- TBeacon
- TBluetoothLE
- Enterprise Mobility Services (EMS) Server
 - User, Device and Data management
 - Remote Push Notifications – APNS and GCM
- TAppAnalytics
- InterBase XE7 database server

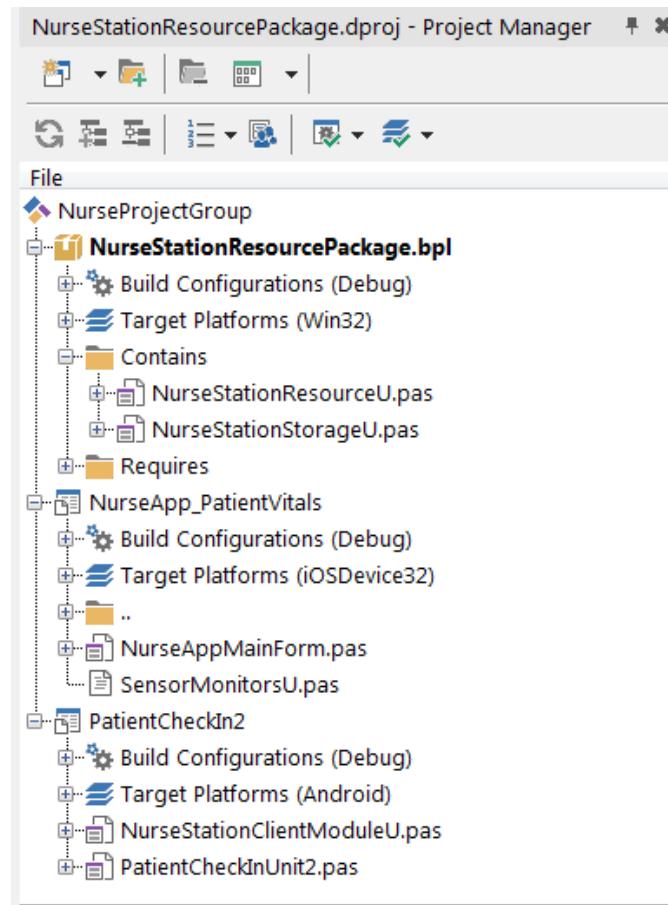
Posto de Enfermagem: Devices Utilizados

- Beacons
 - EM Microeletronic EMBC01 / 30784
 - EM Microeletronic EMBC01 / 29597
- BluetoothLE
 - Zephyr HXM2 Heartrate Monitor
 - Wahoo Fitness Scale
- Smartphones and Tablets
 - iPad 2 com iOS 8.4
 - Nexus 4 com Android 5.1

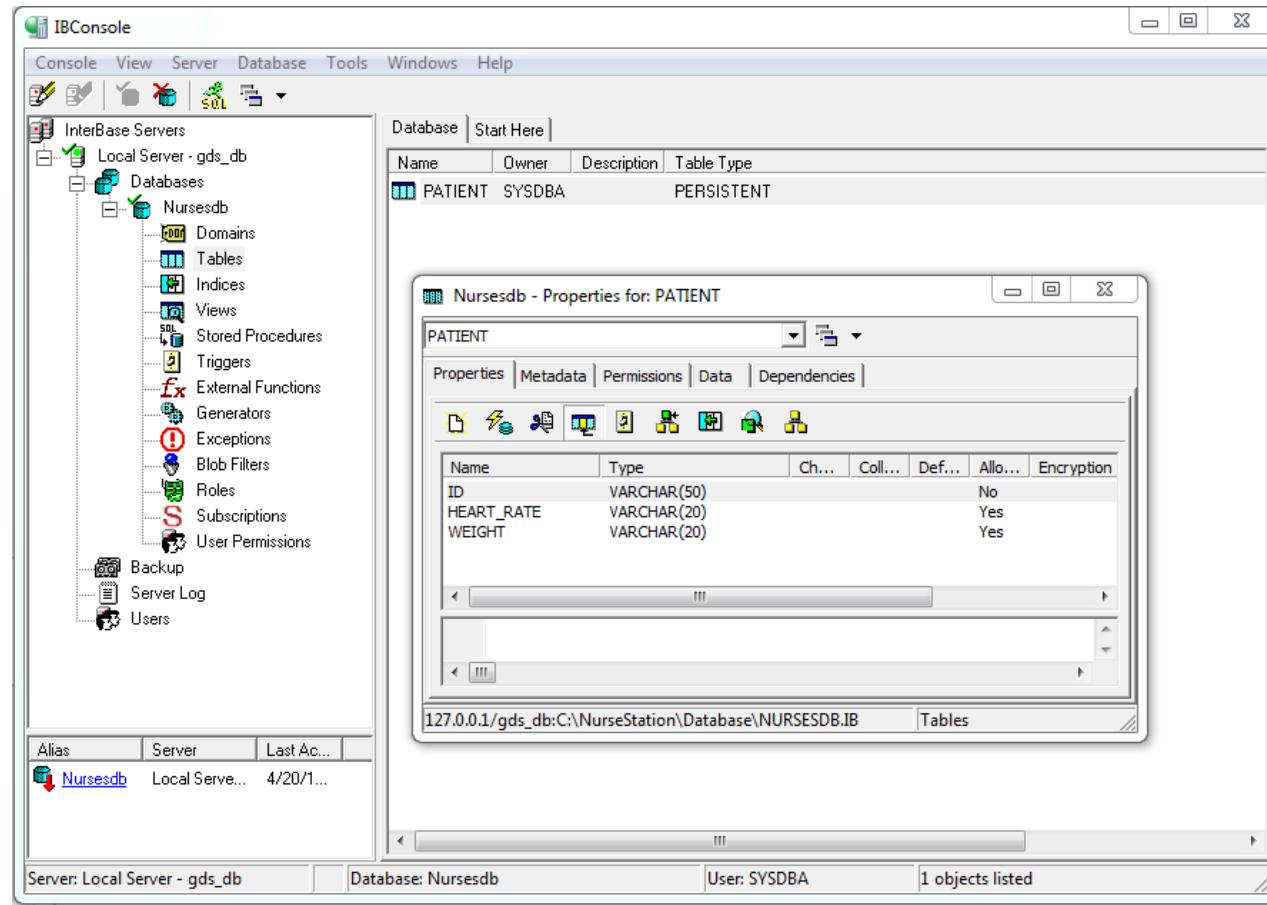
Posto de Enfermagem: Pasta do Projeto



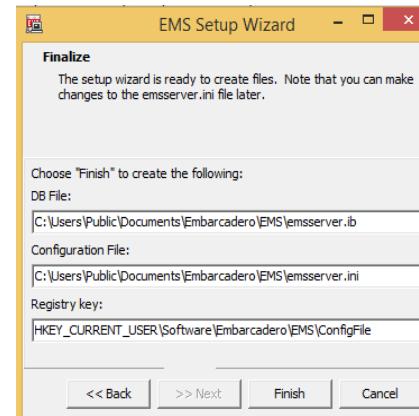
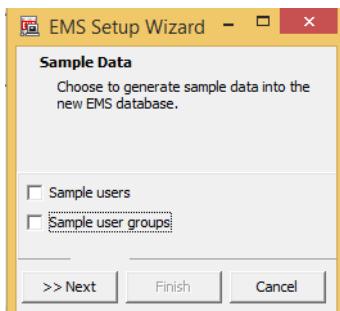
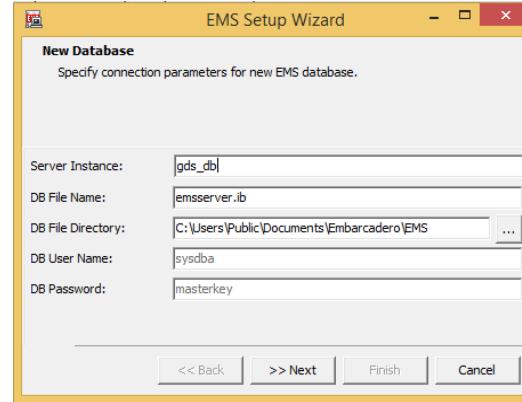
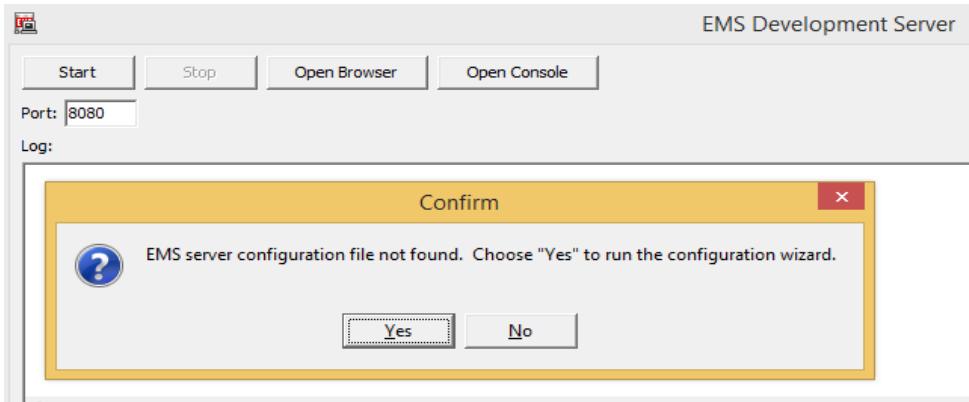
Posto de Enfermagem: Grupo de Projetos



“NURSESDB.IB” InterBase Database



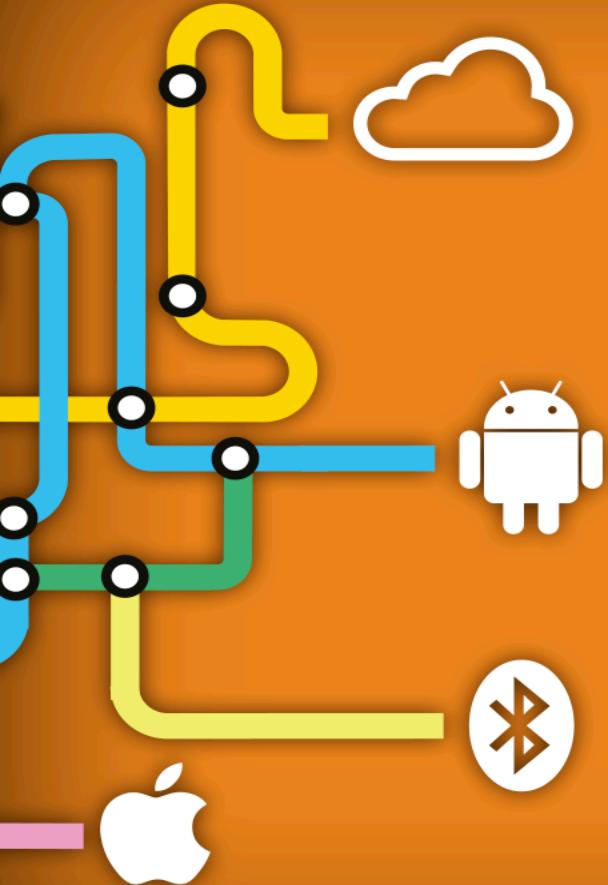
EMS Server – Configuração



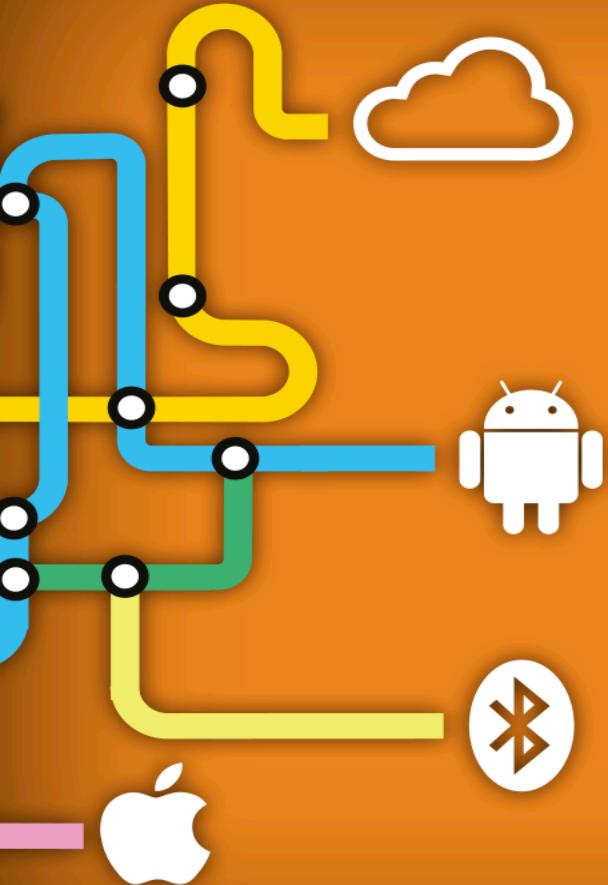
EMS Server – Iniciar / Adicionar Usuários

The screenshot displays four windows related to EMS Server management:

- Console Window:** Shows a connection profile named "New Profile1". It has fields for Host (192.168.1.15), Port (8080), and URL Path. A modal dialog titled "Emsmanagementconsole" shows a "Successful connection" message with an "OK" button.
- User Management Window:** A tabbed interface with "Users", "Groups", "Installations", and "Push" tabs. Below the tabs are buttons for Refresh, Edit, Add, and Delete, along with icons for a list, a plus sign, and a minus sign.
- Add User Dialog:** A modal window titled "Add" for creating a new user. It has fields for "User name" (nurseuser) and "Password" (nursepass). The "Groups" section contains a table with a single row: "Field Name" (Description) and "Field Value" (Nancy Nurse).
- Users Table:** A table showing user data with columns: "username", "_id", "_meta", and "Description". It lists two rows:
 - nurseuser: _id 8B98E8C3..., {"creator":..., "modified":...}, Description Nancy Nurse
 - Test1: _id 611F0317..., {"creator":..., "modified":...}, Description Al Mannarino



Posto de Enfermagem: Demonstração



RAD Studio

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**RAD Studio XE8:
Pronto para IoT!**

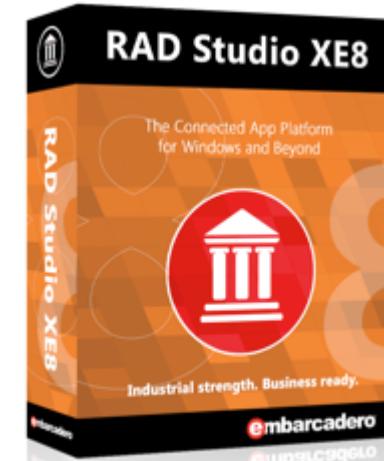
RAD Studio XE8

Versões:

- Professional
- Enterprise
- Ultimate
- Architect

Inclui:

- C++Builder
- Delphi
- HTML5 Builder
- InterBase XE7
- Um rico conjunto de ferramentas de terceiros



Principais Benefícios do RAD Studio XE8

A Plataforma de Apps Conectadas para Windows e Além



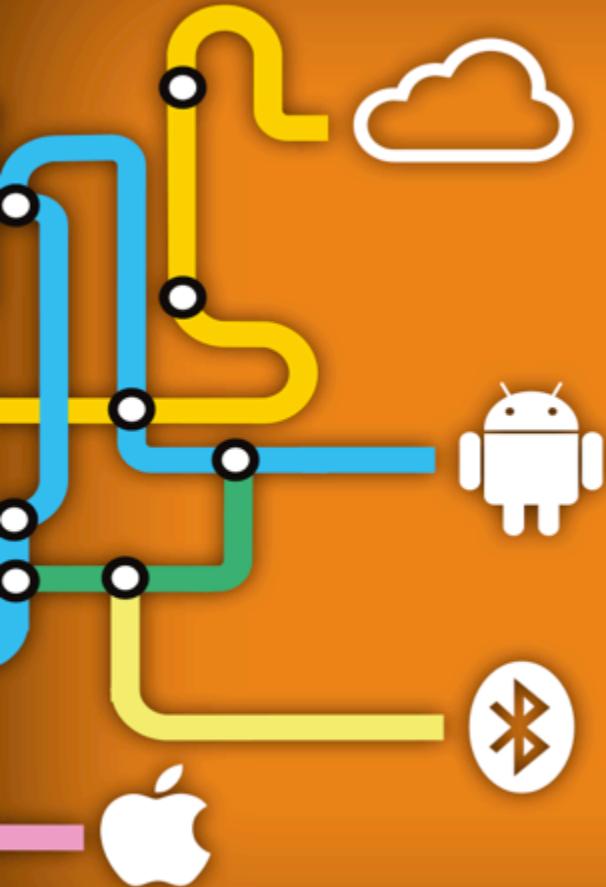
A melhor
ferramenta para
desenvolvimento
multi-device
Windows, OSX, iOS,
Android



Bluetooth, App
Tethering, Beacons
para Internet das
Coisas



Serviços Prontos
para Uso:
AppAnalytics e
Enterprise Mobility
Services



RAD Studio

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Novos Recursos Online

Deseja se aprofundar? Siga o *Skill Sprints!*

- 1 tópico, 20 minutos de conteúdo, Q&A
- www.embarcadero.com/landing-pages/skill-sprints

Developer Skill Sprints

Fast Programming
TIPS, TRICKS & TECHNIQUES

Live online workshops



RAD Studio

Acesse o (Novo) Embarcadero Community

<http://community.embarcadero.com>



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Recursos Adicionais - EMS

- Configurando o EMS Messaging Service
 - [http://docwiki.embarcadero.com/RADStudio/XE8/en/
Setting Up the Messaging Service](http://docwiki.embarcadero.com/RADStudio/XE8/en/Setting_Up_the_Messaging_Service)
- Notificações Push com EMS
 - [http://docwiki.embarcadero.com/RADStudio/XE8/en/
EMS Push Notifications](http://docwiki.embarcadero.com/RADStudio/XE8/en/EMS_Push_Notifications)

Recursos Adicionais – Notificações Push

- Apple Push Notification Service (APNS) -
<https://developer.apple.com/library/ios/documentation/NetworkingInternet/Conceptual/RemoteNotificationsPG/Chapters/ApplePushService.html>
- Google Cloud Messaging (GCM) -
<https://developer.android.com/google/gcm/index.html>

Recursos Adicionais - Beacons

- Tecnologia
 - iBeacon - <https://developer.apple.com/ibeacon/>
 - AltBeacon - <http://altbeacon.org/>
- Alguns Fornecedores
 - Gimbal - https://gimbal.com/doc/ios_proximity_ibeacon_quickstart.html
 - Radius Networks - <http://www.radiusnetworks.com/>
 - Estimote - <http://estimote.com/>
 - Nordic Semiconductor -
<https://www.nordicsemi.com/eng/Products/Bluetooth-Smart-Bluetooth-low-energy/nRF51822-Bluetooth-Smart-Beacon-Kit>
 - EM Microelectronic - <http://www.emmicroelectronic.com/products/wireless-rf/beacons>

Recursos Adicionais – Dispositivos BluetoothLE

- Zephyr HxM2
<http://zephyranywhere.com/products/hxm-smart-heart-rate-monitor>
- Polar H7 Heart Rate Chest Strap
[http://www.polar.com/us-en/products/accessories/H7 heart rate sensor](http://www.polar.com/us-en/products/accessories/H7%20heart%20rate%20sensor)
- Wahoo Fitness Scale
<http://www.wahoofitness.com/devices/wahoo-balance-smartphone-scale.html>

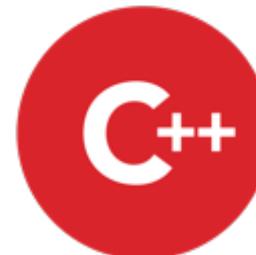
Recursos Adicionais – Bluetooth.org

- BluetoothLE GATT -
<https://developer.bluetooth.org/TechnologyOverview/Pages/GATT.aspx>
- GATT Specifications -
<https://developer.bluetooth.org/gatt/Pages/GATT-Specification-Documents.aspx>
- Bluetooth Smart and Smart Ready -
<http://www.bluetooth.com/Pages/Bluetooth-Smart-Devices-List.aspx>

Recursos Adicionais – Healthcare Tech

- mHealth - <http://en.wikipedia.org/wiki/MHealth>
- Why So Many New Tech Companies Are Getting into Health Care -
<https://hbr.org/2014/12/why-so-many-tech-companies-are-getting-into-health-care>
- The Medical Technologies That Are Changing Health Care -
http://www.hhnmag.com/display/HHN-news-article.dhtml?dcrPath=/templatedata/HF_Common/NewsArticle/data/HHN/Magazine/2015/Apr/cover-medical-technology
- Technology Made Health Care Expensive. Can It Now Control Costs? -
<http://recode.net/2014/04/28/technology-made-health-care-expensive-can-it-now-control-costs/>
- We Need a Moore's Law for Medicine -
<http://www.technologyreview.com/news/518871/we-need-a-moores-law-for-medicine/>

Perguntas e Respostas



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