

# Test Automation @ Spotify

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## Vem testar?

- Utvecklare
- Test Automation (TA)
- Quality Assistance (QA)
- Övriga anställda
  - ✓ Employee releases
  - ✓ TestFlight/HockeyApp
- Användare
  - ✓ inkrementella roll-outs
  - ✓ A/B-test

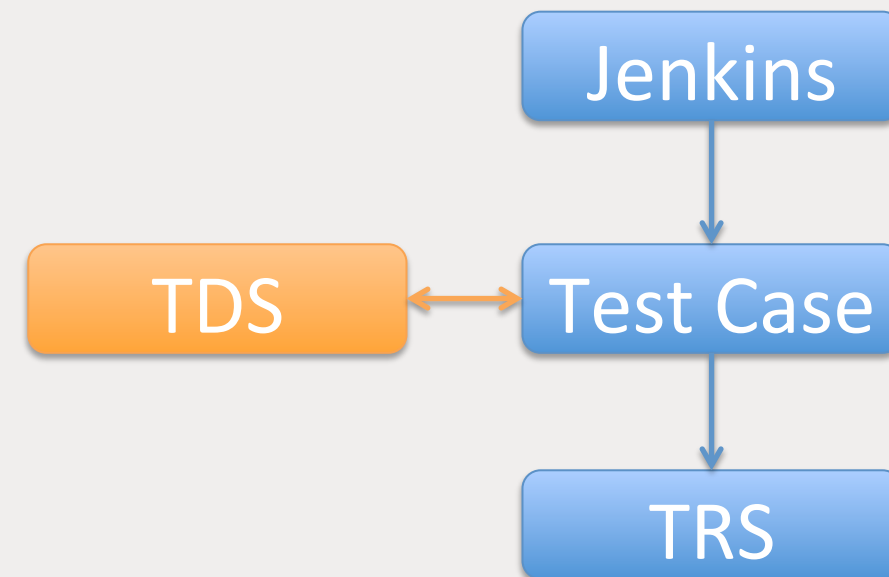


## Varför automatiserar vi?

- Svårt för QA att hinna med både regressionstest & feature test
  - Manuell regressionstest blir lätt repetitiv & tråkig
  - Öka testtäckningen
  - Automatiserade tester körs separat & oberoende av varandra
  - MBT med GraphWalker gör att vi kan köra samma testfall & verifiera samma funktion, men lite annorlunda varje gång
- TA ersätter inte QA – det är ett komplement!

# Hur automatiserar vi?

- QA använder MBT för att skapa modeller [yEd]
- TA använder modeller som spec för implementationen [Java, Python]
- Slumpmässiga turer genom modellerna [GraphWalker]
- Dynamisk och slumpmässig testdata on-demand [TDS]
- Detaljerad resultatrapportering (för TA/teamet) [TRS]
- Grundläggande dashboards (för alla andra) [TRS]
- Kontinuerlig testexekvering 24/7 [Jenkins]



# Modeller

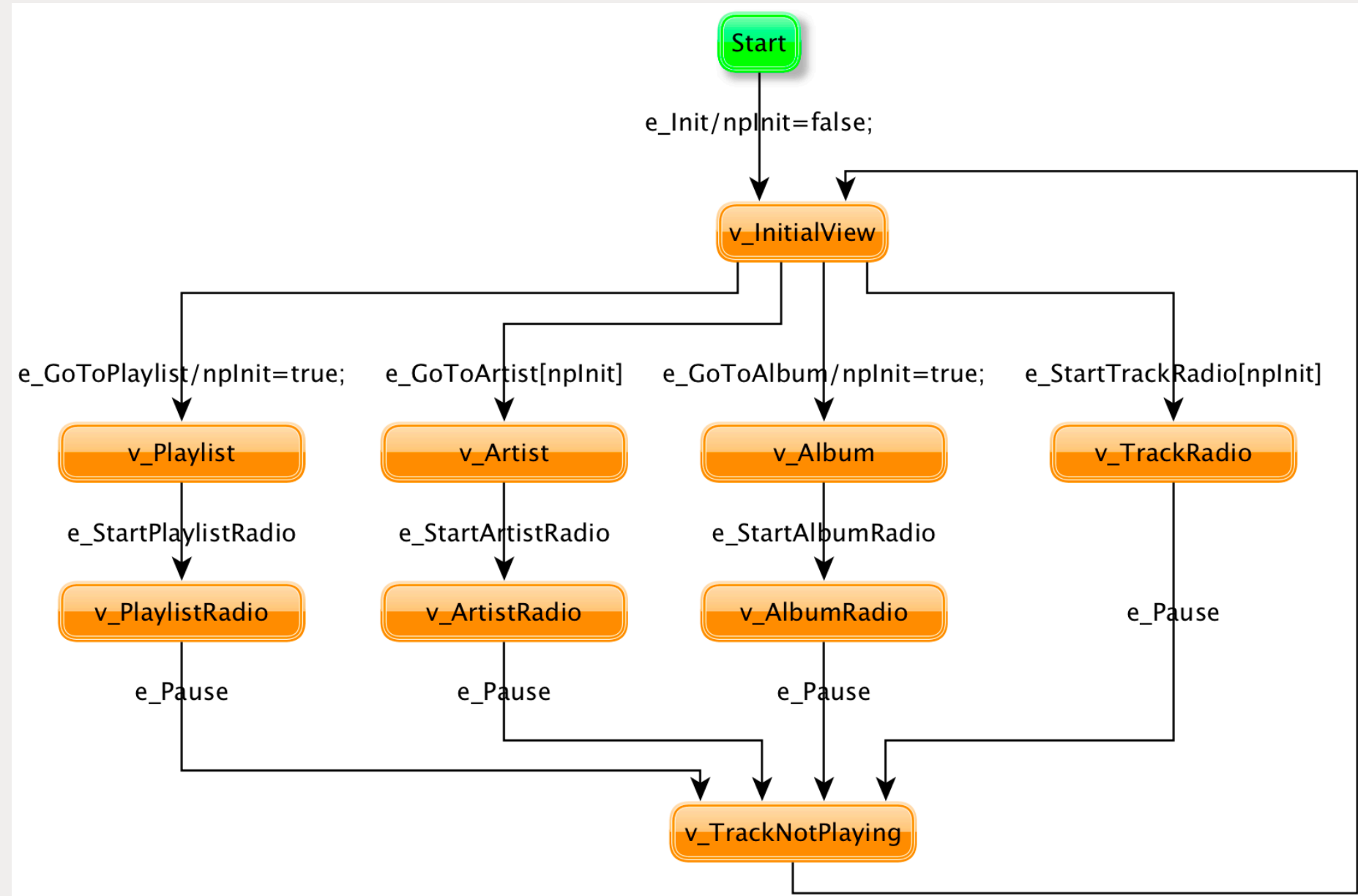
Används av QA för att beskriva:

- flöden
- user stories

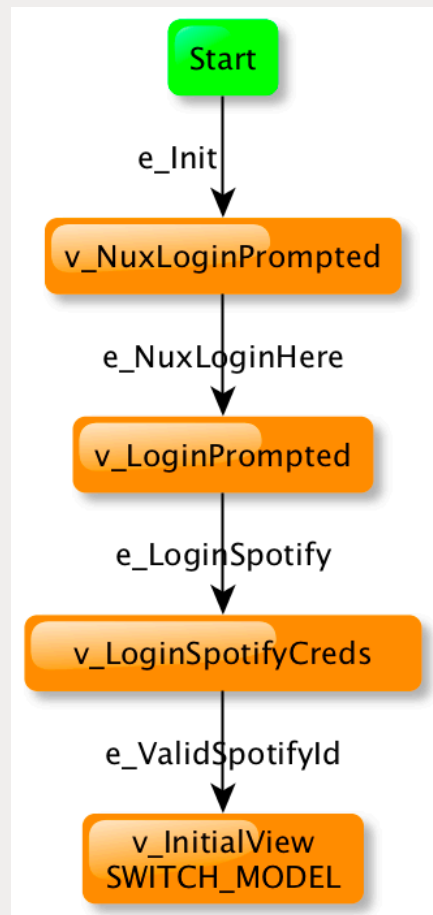
GraphWalker genererar testsekvenser med olika strategier:

- A\*, shortest optimized, random, ...
- olika stop conditions

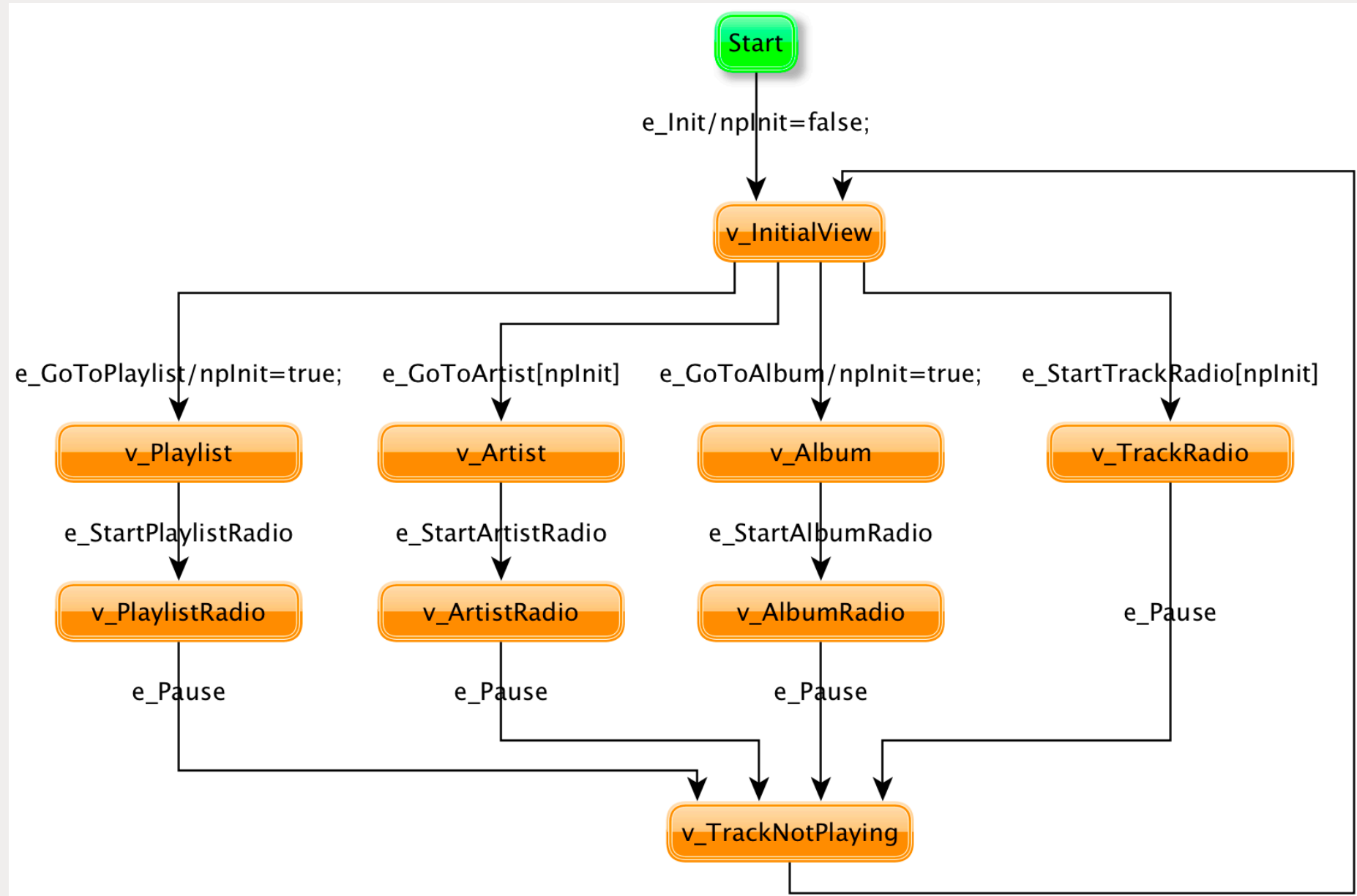
➤ Gör inte för stora modeller!



# Login



# Start Radio From Context



## Test Data Service [TDS]

TDS tillhandahåller alla testfall med testdata, ex: testanvändare, artister, album, etc.

### Exempel:

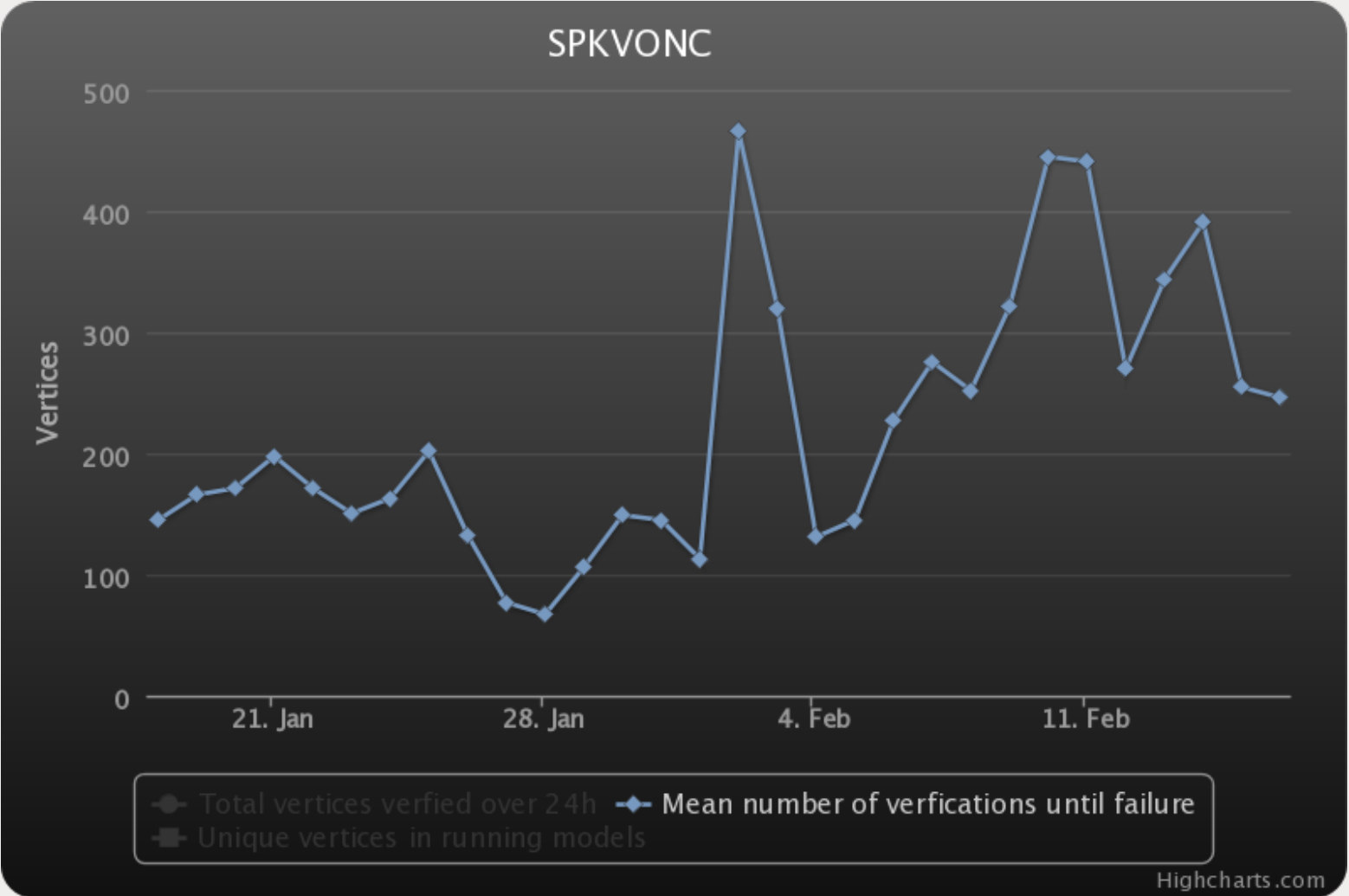
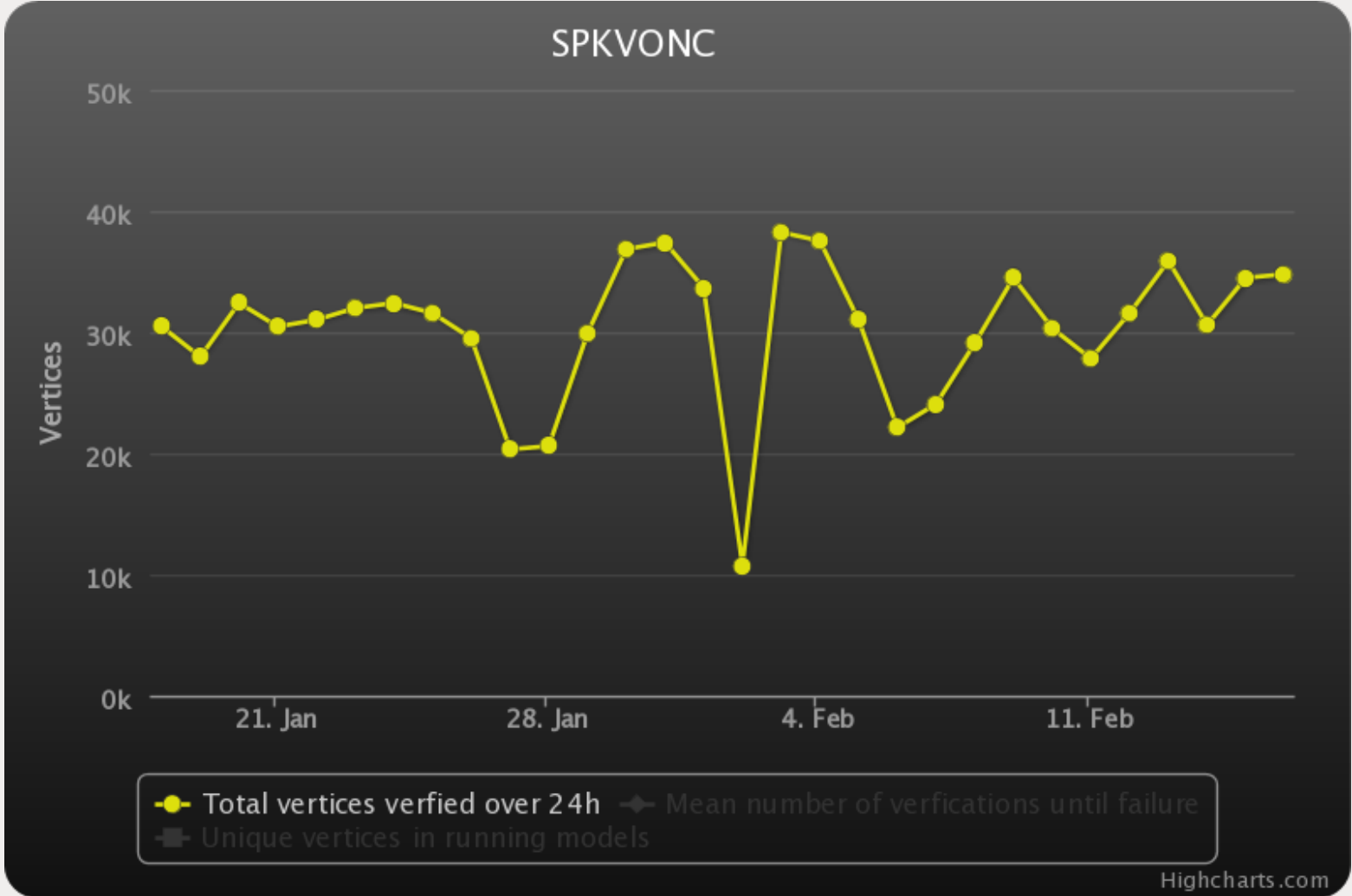
```
UserData user = UserManager.getUser(UserType.PREMIUM, "friends, playlists");
```

**Test Case** - “Jag behöver ett premiumkonto från Sverige som inte är kopplat till Facebook, men som har vänner och spellistor.”

**TDS** - “Jag får 34 träffar, och returnerar en av dessa slumpmässigt. Användaren låses och kan inte användas av andra testfall under tiden.”

# Test Result Service [TRS]

TRS sparar och presenterar alla testresultat.





# Test Result Service [TRS]

TRS sparar och presenterar alla testresultat.

	iPad			
	iPad2	iPad3	iPadMini	iPadSim
AbroadTooLong	Green	Green	Green	Green
AddRemovePlaylist	Green	Green	Green	Green
AddRemoveTrack	Green	Green	Green	Green
ContextMenu	Green	Green	Green	Green
FacebookScrobbling	Yellow	Green	Green	Green
FilterPlaylist	Yellow	Green	Green	Green
FolderStructure	Green	Green	Green	Green
Inbox	Red	Green	Green	Green
Login	Green	Green	Green	Green
OpenMMS_LoggedIn	Green	Green	Green	Green
OpenMMS_LoggedIn_InvalidToken	Green	Green	Green	Green
OpenMMS_LoggedOut	Red	Red	Red	Yellow
OpenMMS_LoggedOut_InvalidToken	Red	Green	Red	Green
OpenURI_LoggedIn	Green	Green	Green	Red

# Test Result Service [TRS]

TRS sparar och presenterar alla testresultat.

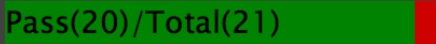
		iPad			
		iPad2	iPad3	iPadMini	iPadSim
AbroadTooLong	↓	Green	Green	Green	Green
AddRemovePlaylist	↓	Green	Green	Green	Green
AddRemoveTrack	↓	Green	Green	Green	Green
ContextMenu	↓	Green	Green	Green	Green
FacebookScrobbling	↓	3P/1F	Green	Green	Green
FilterPlaylist	↓	Yellow	Green	Green	Green
FolderStructure	↓	Green	Green	Green	Green
Inbox	↓	Red	Green	Green	Green
Login	↓	Green	Green	Green	Green
OpenMMS_LoggedIn	↓	Green	Green	Green	Green

1 tests failed and 3 passed this feature/target combination

1868485	about 6 hours ago	com.spotify.qa.aut.client.ios.settings.FacebookScrobblingTest.FacebookScrobbling	Pass(20)/Total(21)	FacebookScrobbling v_NotScrobbling	Finished	Mute
1869955	about 2 hours ago	com.spotify.qa.aut.client.ios.settings.FacebookScrobblingTest.PrivateSession	Pass(30)/Total(30)		Finished	Mute









# Test Result Service [TRS]

TRS sparar och presenterar alla testresultat.

Suite	JENKINS – iPad2 – release
Result	Pass(20)/Total(21) 
Start time	2013-02-16 15:55:24 UTC
TestType	AutomatedSystemTest
Target	iPad2
Name	com.spotify.qa.aut.client.ios.settings.FacebookScrobblingTest.FacebookScrobbling
Jenkins Job	<a href="http://jenkins.spotify.net/job/Run%20test%20on%20iOS%20device%20(Mac%20Mini%203)/2045/">http://jenkins.spotify.net/job/Run%20test%20on%20iOS%20device%20(Mac%20Mini%203)/2045/</a>
Platform	iOS
project	SPKVONC
Branch	release
Model	FacebookScrobbling.graphml
Test description	Test all permutations of Show on FB and Private Session.
Traversing style	SHORTESTNONOPT{EC>=100}
User	qatest3
Spotify version	0.6.0.181
FailStep	v_NotScrobbling
FailFeature	FacebookScrobbling
End time	2013-02-16 15:58:08 UTC
Duration	0 hours, 2 min, 43 sec
FacebookScrobbling.jpg	
Login.jpg	
client.log	
graphwalker.log	

# Test Result Service [TRS]

TRS sparar och presenterar alla testresultat.

Feature	Result	Model	Edge/vertex	Attachments
Login	OK 	Login	e_Init	1361030163722.jpg
Login	OK 	Login	v_NuxLoginPrompted	1361030166862.jpg
Login	OK 	Login	e_NuxLoginHere	1361030170020.jpg
Login	OK 	Login	v_LoginPrompted	1361030174654.jpg
Login	OK 	Login	e_LoginSpotify	1361030178768.jpg
Login	OK 	Login	v_LoginSpotifyCreds	1361030183263.jpg
Login	OK 	Login	e_ValidSpotifyId	1361030190436.jpg
Login	OK 	Login	v_InitialView	1361030196134.jpg
FacebookScrobbling	OK 	FacebookScrobbling	e_Init	1361030199270.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_InitialView	1361030202387.jpg
FacebookScrobbling	OK 	FacebookScrobbling	e_GoToSettings	1361030207543.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_Settings	1361030215239.jpg
FacebookScrobbling	OK 	FacebookScrobbling	e_DisablePrivateSession	1361030218860.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_PrivateSessionDisabled	1361030225255.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_ShowOnFBEnabled	1361030229882.jpg
FacebookScrobbling	OK 	FacebookScrobbling	e_EnablePrivateSession	
FacebookScrobbling	OK 	FacebookScrobbling	v_PrivateSessionEnabled	1361030251689.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_ShowOnFBDisabled	1361030256320.jpg
FacebookScrobbling	OK 	FacebookScrobbling	e_PlayTrack	1361030271634.jpg
FacebookScrobbling	OK 	FacebookScrobbling	v_TrackPlaying	1361030281173.jpg
FacebookScrobbling	FAIL 	FacebookScrobbling	v_NotScrobbling	1361030285690.jpg

# Test Result Service [TRS]

Redo för release?

	iPad			
	iPad2	iPad3	iPadMini	iPadSim
AbroadTooLong	Green	Green	Green	Green
AddRemovePlaylist	Green	Green	Green	Green
AddRemoveTrack	Green	Green	Green	Green
ContextMenu	Green	Green	Green	Green
FacebookScrobbling	Yellow	Green	Green	Green
FilterPlaylist	Yellow	Green	Green	Green
FolderStructure	Green	Green	Green	Green
Inbox	Red	Green	Green	Green
Login	Green	Green	Green	Green
OpenMMS_LoggedIn	Green	Green	Green	Green
OpenMMS_LoggedIn_InvalidToken	Green	Green	Green	Green
OpenMMS_LoggedOut	Red	Red	Red	Yellow
OpenMMS_LoggedOut_InvalidToken	Red	Green	Red	Green
OpenURI_LoggedIn	Green	Green	Green	Red

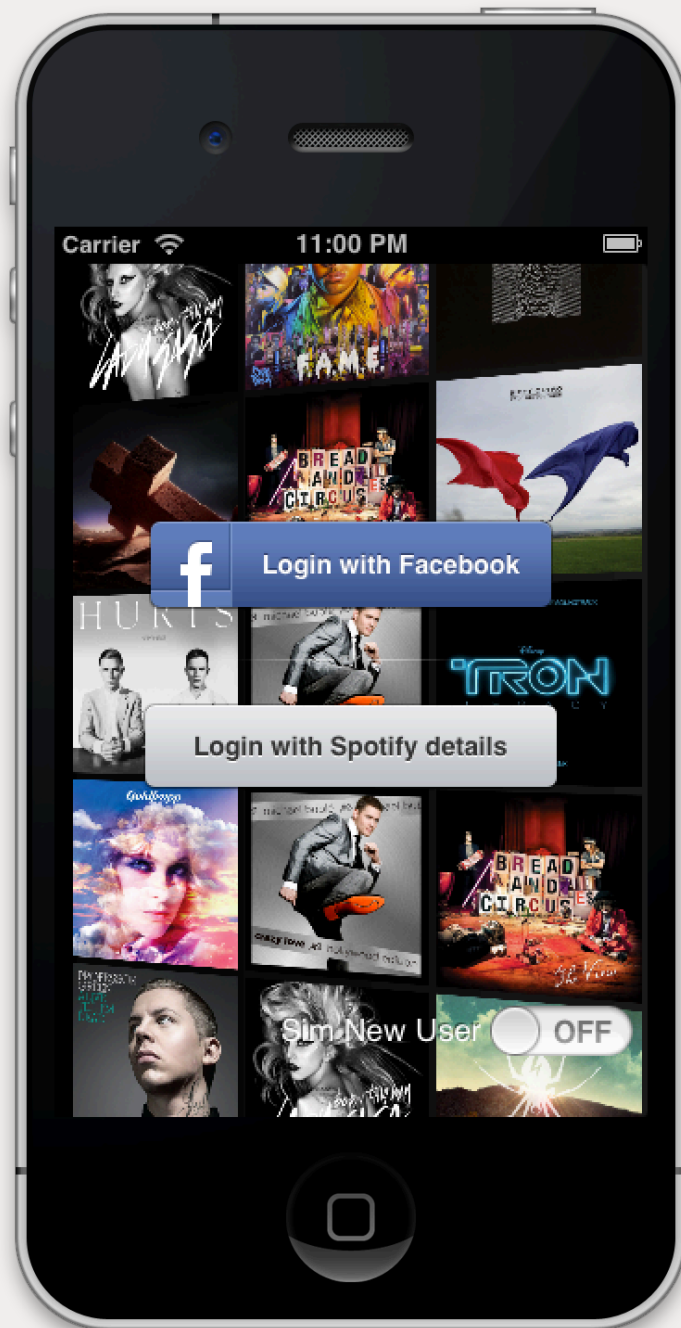
# Test Result Service [TRS]

## Release Tests

- Alltid gröna
- Prio 1

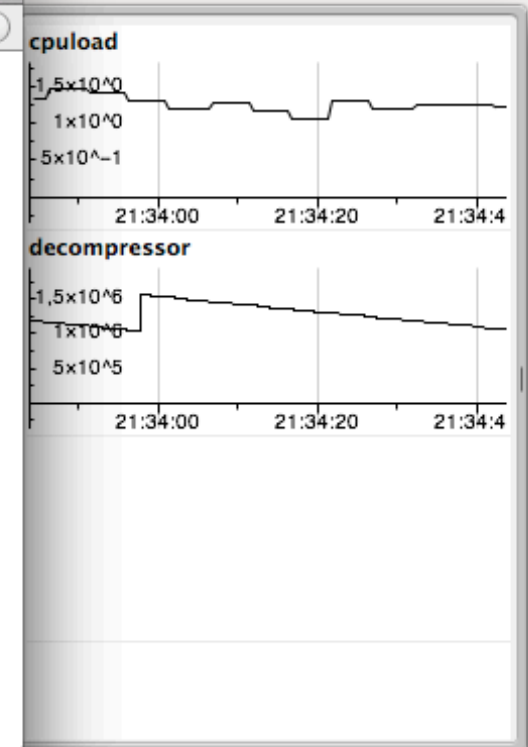
		iOS	
		iPadSim	iPhoneSim
Login	↓		
Search	↓		
StreamNonPremium	↓		
StreamPremium	↓		
SyncPlaylist	↓		

# NuRemote - <https://github.com/nevyn/NuRemoting>



```
iPhone Simulator: Spotify
complete (code: 0)
20:33:10.853 I [snd:407] 64k-Latency: 1 ms. Play
latency: 161 ms (ap)
20:33:10.898 I [file_streamer_simple.cpp:789]
Request for file
aac0cba75f4b8e483a67695861b7fd2d6888dff
complete (code: 0)
20:33:57.730 I [file_streamer_simple.cpp:789]
Request for file
aac0cba75f4b8e483a67695861b7fd2d6888dff
complete (code: 0)

Connected
Receiving 4423 bytes of stats...
Primed cpuload with 120 data points.
Receiving 20289 bytes of stats...
Primed decompressor with 561 data points.
((SpotifyAppDelegate appDelegate) window)
<UIWindow:8e30010>
(((SpotifyAppDelegate appDelegate) window)
frame)
(0 0 320 480)
```



DEMO!





# Vad automatiserar vi?

- Desktop [VMs + Mac Minis]
  - ✓ Windows – XP, Vista, 7 (32- och 64-bit)
  - ✓ Mac OSX – 10.5, 10.6, 10.7
  - ✓ Linux – Kubuntu 12, Ubuntu 12 (32- och 64-bit)
- Mobile [devices + simulators]
  - ✓ Android
  - ✓ iOS
- Payment [VMs]



# Verktyg

**yEd** – för att skapa modeller

**GraphWalker** – genererar testsekvenser online/offline

**Sikuli** – verifiering med bildigenkänning (desktop)

**Selenium** – verifiering på webb

**NuRemote** – verifiering med källkod (mobil)

**TestNG** – testramverk

**Java & Python** – kodimplementations

**Jenkins** – triggar testkörningar 24/7

**VirtualBox** – för att virtualisera olika testmiljöer

Frågor?



# Tack!

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Vi anställer! Kolla in <http://www.spotify.com/jobs>

February 21, 2013



# Diskussionsfrågor

- Behöver en bra testautomatiserare även vara en bra testare?
- Hur säkrar man kvalitet när team över hela världen är delaktiga i samma leverans?
- Mobilappar måste testas på en mängd olika hårdvara och operativsystem. Vilka kombinationer ska testas, när är man färdig?

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