AUTOMATING TESTING TO MEET ENTERPRISE SLA'S

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"**Quality is free, but only to those who are willing to pay heavily for it**"

Tom Demarco, **Peopleware**

Insufficient Testing is Costly

Costs of Bugs Found in Field vs. in Testing

▶ Operational cost to fix is 50 to 100x[1]

+ Customer SLA payouts

+ Damage to potential future business

+ Potential brand damage

[1] Understanding and Controlling Software Costs, B.W. Boehm and P.N. Papaccio, IEEE Transactions on Software Engienering, Volume 14 Issue 10, October 1988

Lack of Automation is Wasteful

Test Lab Infrastructure Symptoms:

▶ Poor inventory tracking

▶ Offline test topology design

▶ No or low sharing of costly equipment

▶ Needless power consumption

▶ Chaotic, manual connectivity

▶ Test breaks and disruptions

▶ High setup to testing ratio

Lack of Automation is Wasteful

Testing Process Symptoms:

▶ Primarily manual testing

▶ Time-consuming device provisioning

▶ Script fragility and lack of scaling

▶ Minor coverage

▶ Few programmers are bottleneck

▶ Automation testing stuck at 10%

▶ Poor automation ROI

10%
penetration

Minor coverage

Poor ROI

http://www.despair.com/quality.html

QUALITY

THE RACE FOR QUALITY HAS NO FINISH LINE-
SO TECHNICALLY, IT'S MORE LIKE A DEATH MARCH.

Enterprise Telephony Case

Global 500 Service Provider

- Revenues in tens of $billions
- More than 70K employees
- Global presence
- Sample services offered
  - Wired line and broadband
  - IT services and out sourcing
  - IPTV
  - Telephony/VoIP

SCTE Society of Cable Telecommunications Engineers

Enterprise Telephony Case

Goal: Increase quality, speed releases

▶ Required more efficient pre-deployment testing

▶ Testing covers all network and OSS elements

- Multiple tools such as Empirix, GLComm testers

- Wireshark/Tshark packet capture tool

- VoIP phone registration against web-based GUI application

- End to end call support

Enterprise Telephony Testing:

▶ Web-based phone provisioning/registration

▶ Call flow testing

 – SIP call and answer

 – Analog call and answer

▶ Deep packet inspection analysis of packet capture traces

▶ Phone de-provisioning test
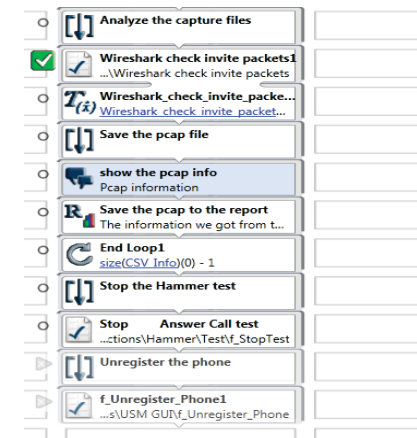
Enterprise Telephony Case

Major Challenges

▶ Long test setup times due to poor lab sharing

▶ Increasing CAPEX investment, poor ROI

▶ Manual testing process

   – Costly contractors required for major releases

▶ Lengthy test cycles slowed time to market

Object-Oriented Automation

State of the Art Architectural Approach

▶ Captures all lab inventory as resource objects

▶ Automation actions as small-scope objects

  – EG: Login to a router = one object

▶ Objects live in a shared library
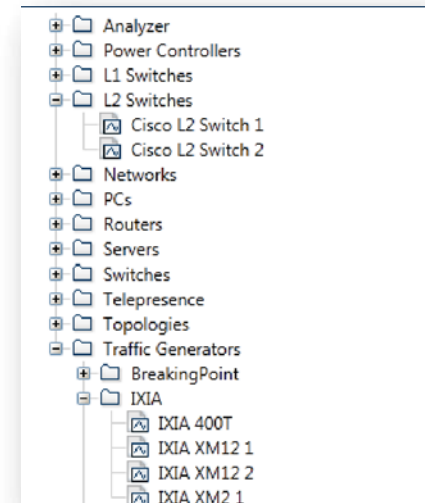
Lab Infrastructure Management

- ▶ Inventory-aware test topology design
  - – Instead of offline Visio
  - – Drag and drop from resource object library
  - – Integrated connectivity management
- ▶ Lab-wide resource scheduling
  - – Prevents resource conflicts
- ▶ Lab as a service (LaaS) cloud
  - – "Hands-off" model
 - – Enables effective remote use

50% to 200%
Device utilization increase reported by organizations using lab automation software

Object-Oriented Test Automation

▶ **Programmers maintain object library**

– Highly reusable
– Easy to maintain

▶ **Non-programmers create automation**

– GUI-driven workflow engine

▶ **Shift balance from tribal to systemic knowledge**

Automation Penetration

Object-Driven Automation

Script based Automation

Test Cycle Acceleration, ROI
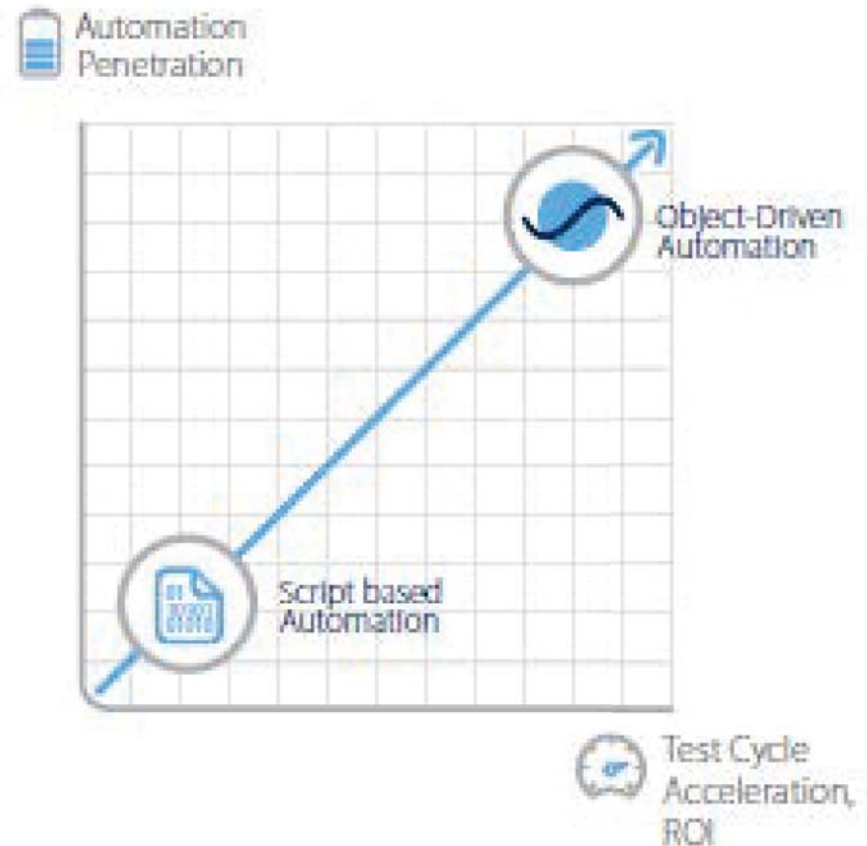
Enterprise Telephony Case

- Achieved 80% automation in critical testing areas within 9 months
- Reduced dependence on external test contractors
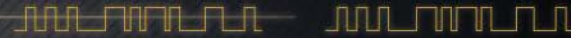- Much high lab efficiency
- 12 month payback on automation investment

Conclusion

Automation Saves and Accelerates

- Lab infrastructure management software can bring significant CAPEX and OPEX savings
- Object-oriented test automation can dramatically increase quality
- Very compelling ROI and fast payback is possible and proven