



valid
stay ahead


Exploitation testing

For testing Service Level Agreements



KONINKLIJKE VLAAMSE
INGENIEURSVENENIGING 7 april 2011

Inspired by  **apg**
All Pensions Group



valid
stay ahead

Introduction

- ISEB Practitioner
- Lean Six sigma green belt
- Over 12 years experience within testing area



valid
stay ahead

Edwin van Loon

Willemstrangelt 101
6221 BH Maastricht
T +31 (0)88 900 36 00
F +31 (0)88 900 36 10
M +31 (0)6 112 79 225
edwin.van.loon@valid.nl
www.valid.nl



Agenda

- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples



Agenda

- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples





Valid's vision on testing

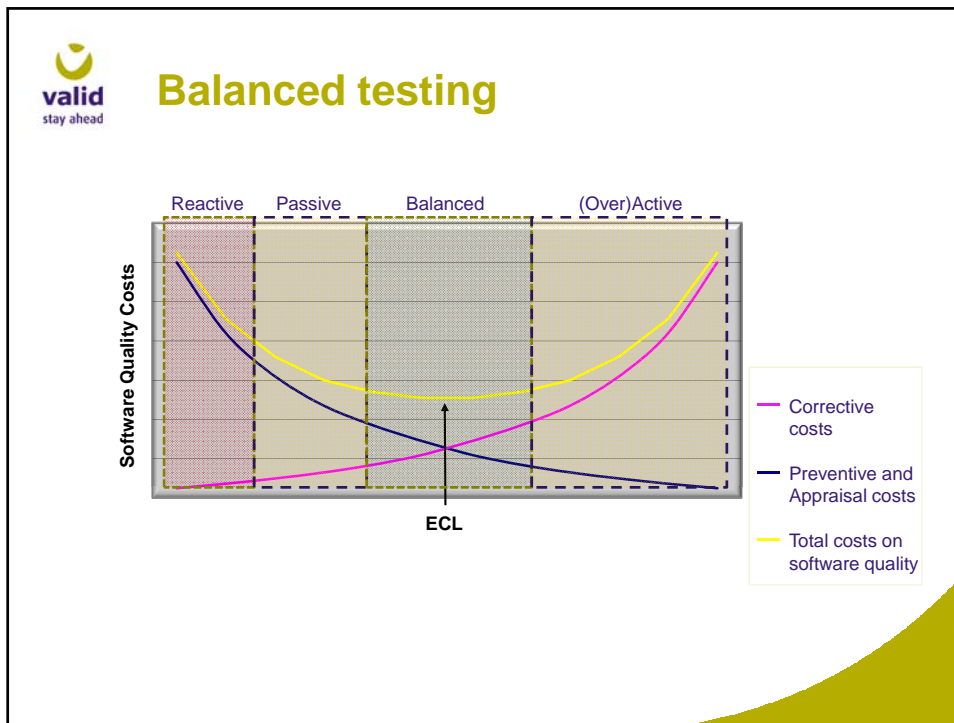
“Valid delivers certified test professionals and test related products and services
Tailor made , independent
of existing test methods, techniques and tools, on which
optimal quality control
of the business risk of customers is centralized.”



Optimal quality control

Objective:


- ☺ To achieve and maintain the needed quality conformance level with lowest cost by an optimum balance between:
 - ☺ Preventive: Requirement management, change management, etc.
 - ☺ Corrective: Cost related to correcting failures and the damage of it
 - ☺ Detective: Test and QA



 **Agenda**

- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples

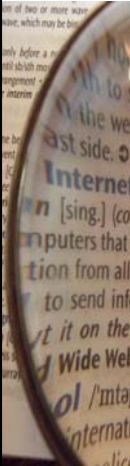




Understanding Exploitation testing

- Based on Dutch term 'Exploitatie test'
- Definition:

Check whether the agreed or expected Service level related to IT infrastructures can be achieved.
- Those agreements and/or expectations are formalized in Service Level Agreements (SLA)
- Represents a group of quality attributes




Service Level Agreement (SLA)

- A **negotiated agreement** between two parties
 - customer and service provider
- Containing measurable KPI's, such as:
 - 99.9% uptime per month => max. downtime: 43.2 minutes
 - 95% of transactions completed within 3 second
 - Mean Time To Recovery of 4 hours
 - 98% of batch jobs executed within batch window
 - Maximum response time of 30 minutes





Trends in IT service providing

Formalization of SLA's, due to:

- Increased Integration of systems
- Globalization (higher availability)
- Third party involvement
- Growing complexity of architectures and

**Growing need for quality
(and structured test approaches)**



Hot Trends 1: Cloud-computing

- Definition
 - provision of computational resources on demand via a computer network (internet).
- Testing cloud-computing architectures
 - Security
 - Performance / scalability
 - Availability
- Using cloud-computing to test web based applications
 - Generating load
 - Test environments in the cloud

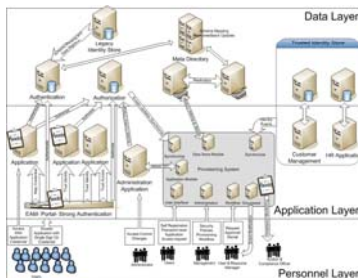




Hot Trends 2: Identity and access management

- Definition:

Manage data used in an information system to **authenticate** users and **grant or deny access rights** to data and system resources.
- Testing IAM environments
 - Authentication and authorization (security)
 - Processes (positive and negative)



Agenda



- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples






All Pension Group

- Pension provider for international pension funds
- Approximately 4000 staff provide pensions for around 4 million participants
- Internal IT department (CIS) exists of:
 - Application Services (AS) – Software development
 - Exploitation Services (ES) – Service management
 - And others, like QA and Financial control
- Mission of CIS: Allow business to excel by delivering ICT services

Test optimization

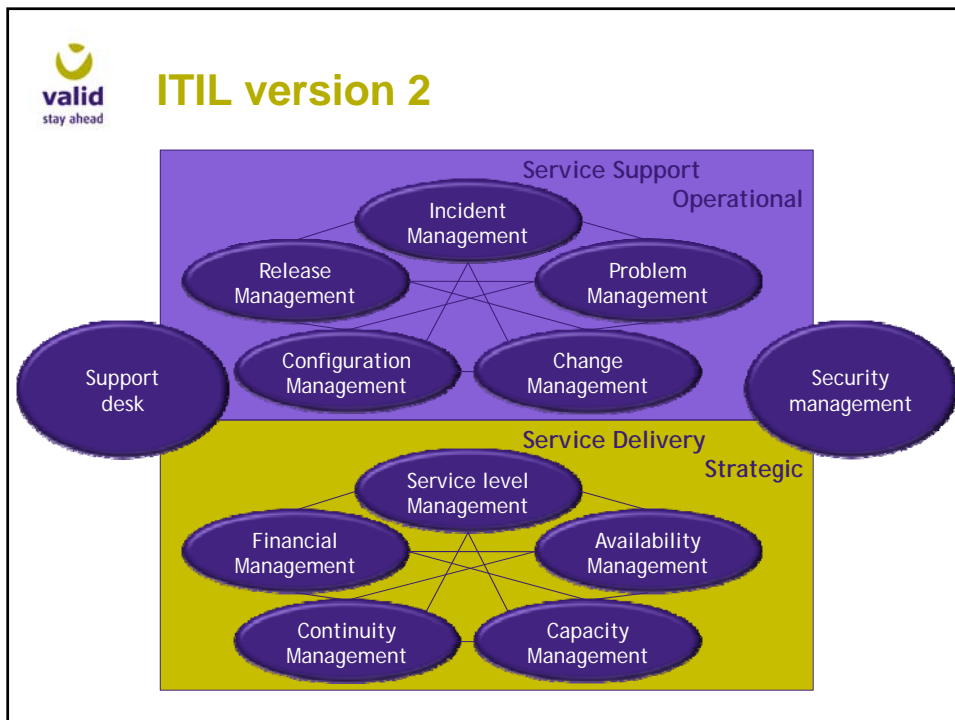
- One of the optimization targets:

Involve ES in an earlier stage in project and incorporate a formal test approach
- Implemented elements:
 - Involvement at reviews of specifications
 - Introduction of Test specification techniques at Exploitation tests
- Result:
 - Improved the quality of advice given to stakeholders
 - Better understanding of the software and daily tasks
 - Increased confidence



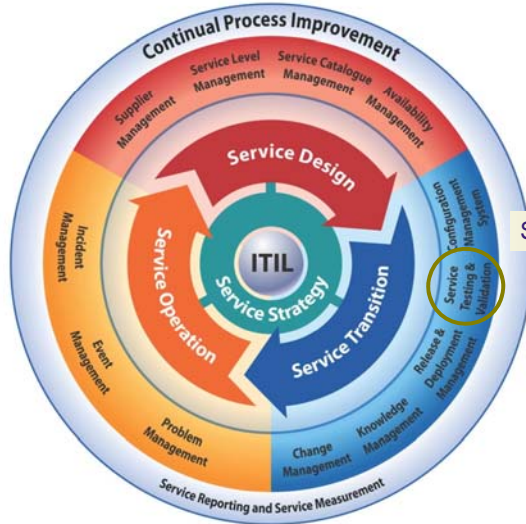
Agenda

- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples



Short view on ITIL v3

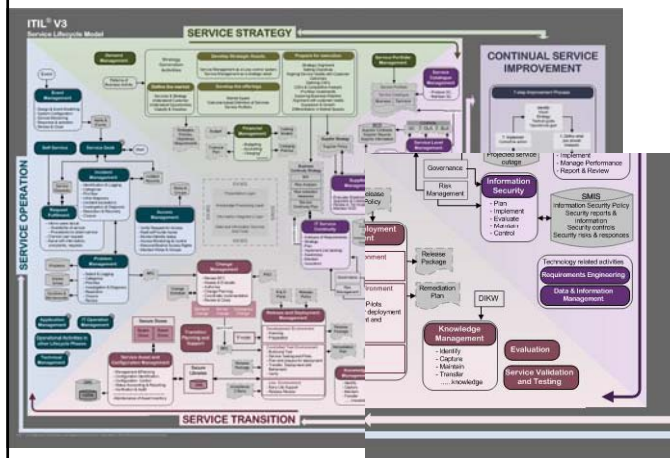


Service Validation and Testing



Service Testing & Validation

Ensure that IT service meets its functionality and quality requirements and that service provider is ready to operate the new service when it is deployed.



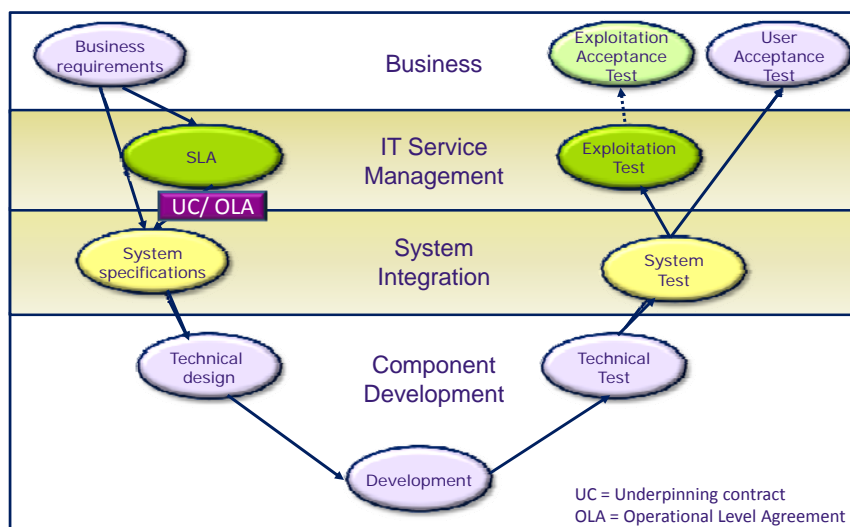


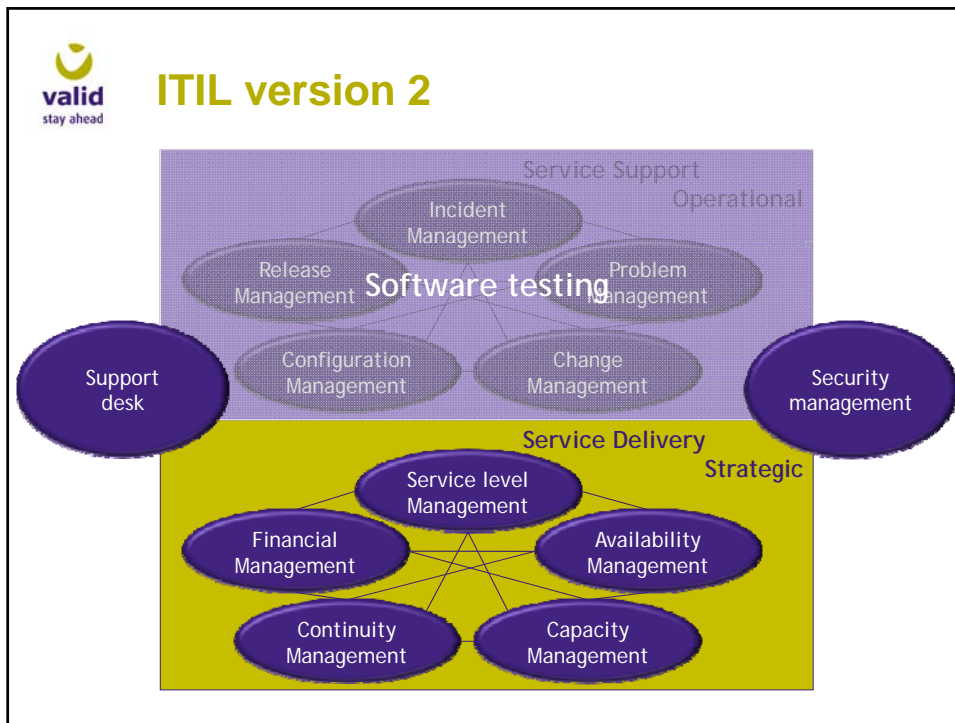
Differences between ITIL 2 and 3

ITIL v2	ITIL v3
Proces oriented	Service oriented
Based on implementation and management of processes	Based on the lifecycle of services and improving processes
Testing not explicitly mentioned	Testing explicitly mentioned
Most used method	Propagated version



Exploitation test within the V-model







SLA items versus Software testing

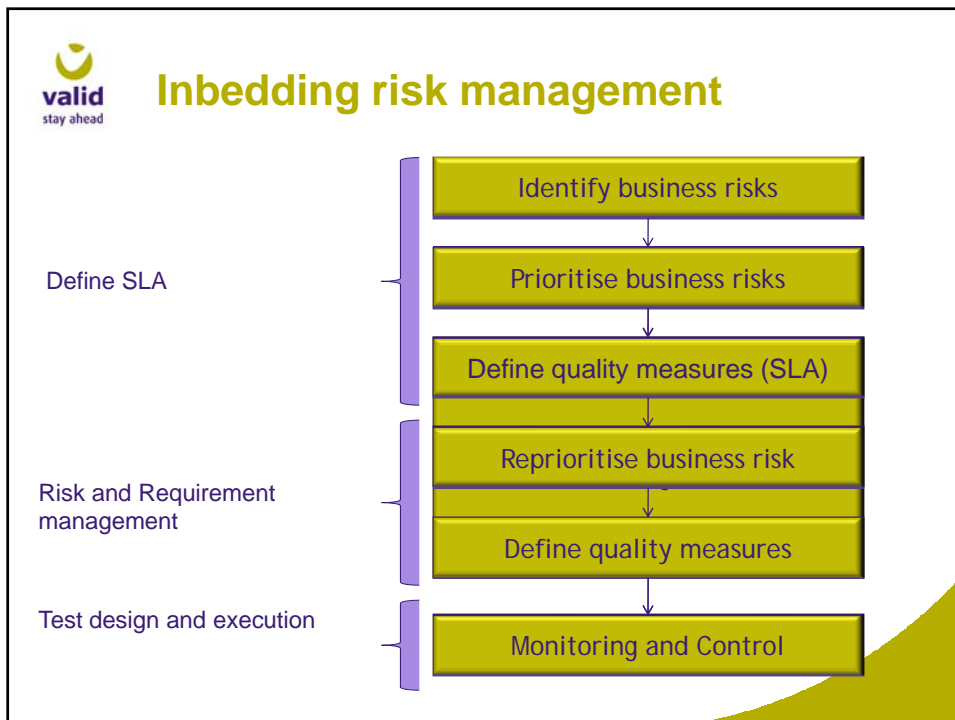
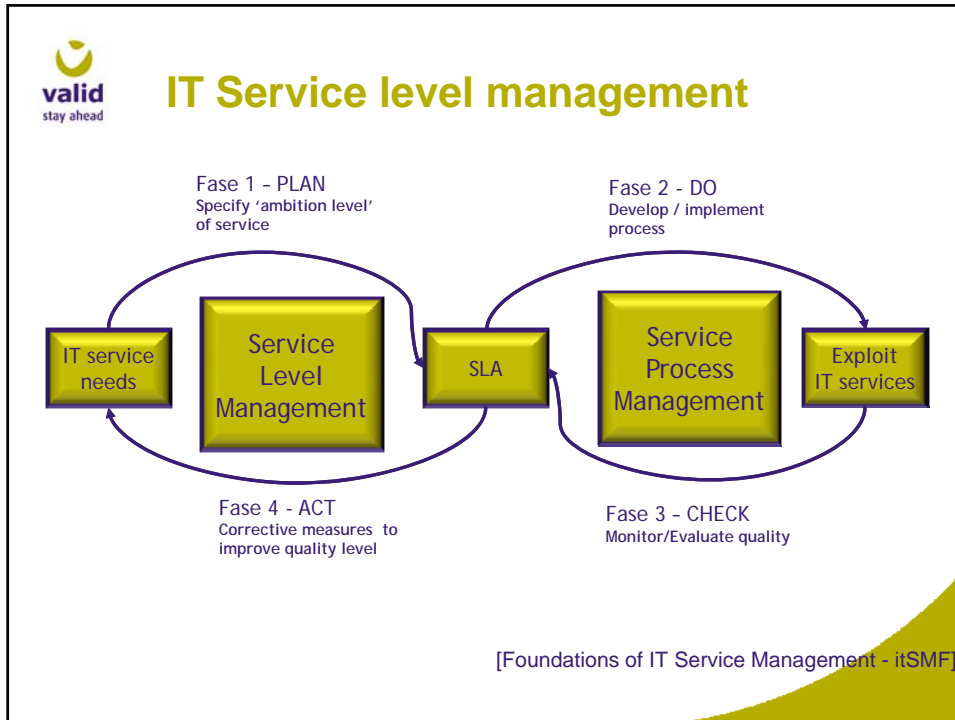
SLA Items	ITIL	Quality attributes	ISO
Availability		Maturity / Fault tolerance	
Down/maintenance time		Maintainability / Recoverability	
Security		Security	
Capability		Efficiency	
Service related Items		Quality attributes	
Verifiability		Understandability / Analyzability	
Serviceability		Operability (IT Service perspective)	



Agenda

- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples







Testing within Security management

Security testing:

- Implicitly testing (authentication and authorization)
- A creative process
- Many tools and sites available, for simulating 'hack' attempts: (QAIInspect, AppScan, etc.)
- Points of attention:
 - Test also on virus prevention
 - Be aware of position within the network (position towards routers/firewalls/etc.)



Testing within Capacity management

Performance testing:

- May best practices and tools
- General steps:
 1. Specify performance requirements
 - Maximum transaction time (per component) at
 - (realistic) load of environment
 2. Define 'Workload' scenario's
 - Define profiles (daily, monthly, etc.)
 - Cluster transactions (calculation, read and update intensity)
 - Define workload scenario
 3. Define performance counters
 - Monitor system/network/application utilisation
 4. Execute performance test
 5. Extrapolate testresults
 6. Performance optimisation

[TMap, Mieke Gevers, e.a.]



Use of State Transition Testing

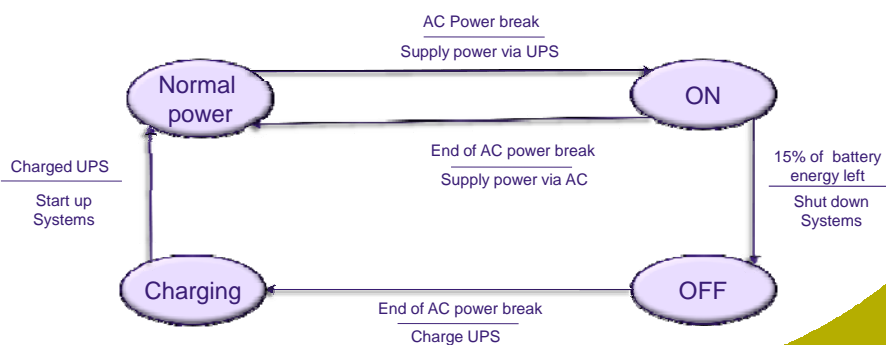
Test specification steps:

1. Specify the system components influencing the availability of the system
2. Specify the failures that may occur
3. Specify the measures taken to prevent these failures
4. Conduct State Transition Diagram
 - a. Define the states in relation to these measures
 - b. Visualize the status and transitions between
5. Specify the test cases



Example State Transition Testing (1)

1. Critical system component: **application and database servers**
2. Business risk: **systems unavailable, due to AC power break**
3. Preventive measure: **uninterruptible power supply (UPS)**
4. State Transition Diagram





Example State Transition Testing (2)

5. Specify test cases

	TC1	TC2	TC3	TC4	TC5
Start State	Normal power	ON	OFF	CHARGING	ON
Trigger	AC Power break	15% energy left	End of AC power break	20% charged UPS	End of AC power break
Action	Supply power via UPS	Shut down systems	Charge of UPS	Start up systems	Supply power via AC
End State	ON	OFF	CHARGING	Normal power	Stand By
Expectation	Servers are operating Routers are operating UPS is active	Administrator is notified Related systems are notified Routers are shutdown Active processes are stopped Temporary data is saved Servers are shut down	UPS is charging Systems are down Routers are down	Servers are started up Temp. data is reprocessed Routers are started up Related systems are notified	Servers are operating Routers are operating UPS is in standby modus


[Based on a 0-switch coverage]







Agenda


- Introduction
- Understanding Exploitation testing
- Inspired by APG
- Service Level Management
- Testing and Service Level Management
- Real life examples






Real life examples

-  Part of test optimization
-  Identity and Access management project
-  Broker system with high availability requirements
-  Multi copier with explicit performance requirements



Test optimization



- One of the optimization targets:

Involve ES in an earlier stage in project and incorporate a formal test approach
- Implemented elements:
 - Involvement at reviews of specifications
 - Introduction of structured testing at Exploitation department
- Expected result:
 - Improved the quality of advice given to stakeholders
 - Better understanding of the software and daily tasks
 - Increased confidence



IAM implementation



- Real life tests using State transition test
- Check:
 - Quality of implementation
 - Whether service management is able to for fill it's job
- Result:
 - Quality and risk awareness at service management department
 - Real life tests executed by service management:
 - Prepared on possible situations at production



Broker system

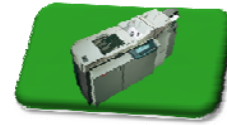


- Integrated test of broker system:
 - Functionality (exchange, subscription, filtering)
 - Security (dynamic and static authorization)
 - Connectivity (integration of different parties/systems)
 - Present certification approach for alligning new parties
 - Availability test using State transition test to check:
 - Load balancing mechanism
 - Uninterruptible power supply (UPS)
 - Fail over mechanisms on routers, queues, databases, etc.
 - 'Druppel test' to check memory leakage





Multi copier




- Test in different environments and conditions:
 - Test environment containing:
 - Different printers and computers (hardware)
 - Different network protocols
 - Different Operating systems
 - Different applications and page description languages
 - And even different voltages (Dutch/American)
 - Performance test 'fluitjes test' using real life scenario's
 - 3165 -> 60 pages per minute and not less
 - 3155 -> 50 pages per minute and not less BUT also not more



Resuming


- Based on ITIL
- Base of testing: SLA
- Increased need for quality
- Scope of exploitation testing
 - Concretizing SLA
 - Security testing
 - Performance testing
 - **Continuity testing**
 - Possible via State Transition Test





valid
stay ahead

Questions?



valid
stay ahead

Edwin van Loon

Wilhelminasingel 10/
6221 BH Maastricht
T +31 (0)88 900 95 00
F +31 (0)88 900 95 02
M +31 (0)6 152 59 223
edwin.van.loon@valid.nl
www.valid.nl