



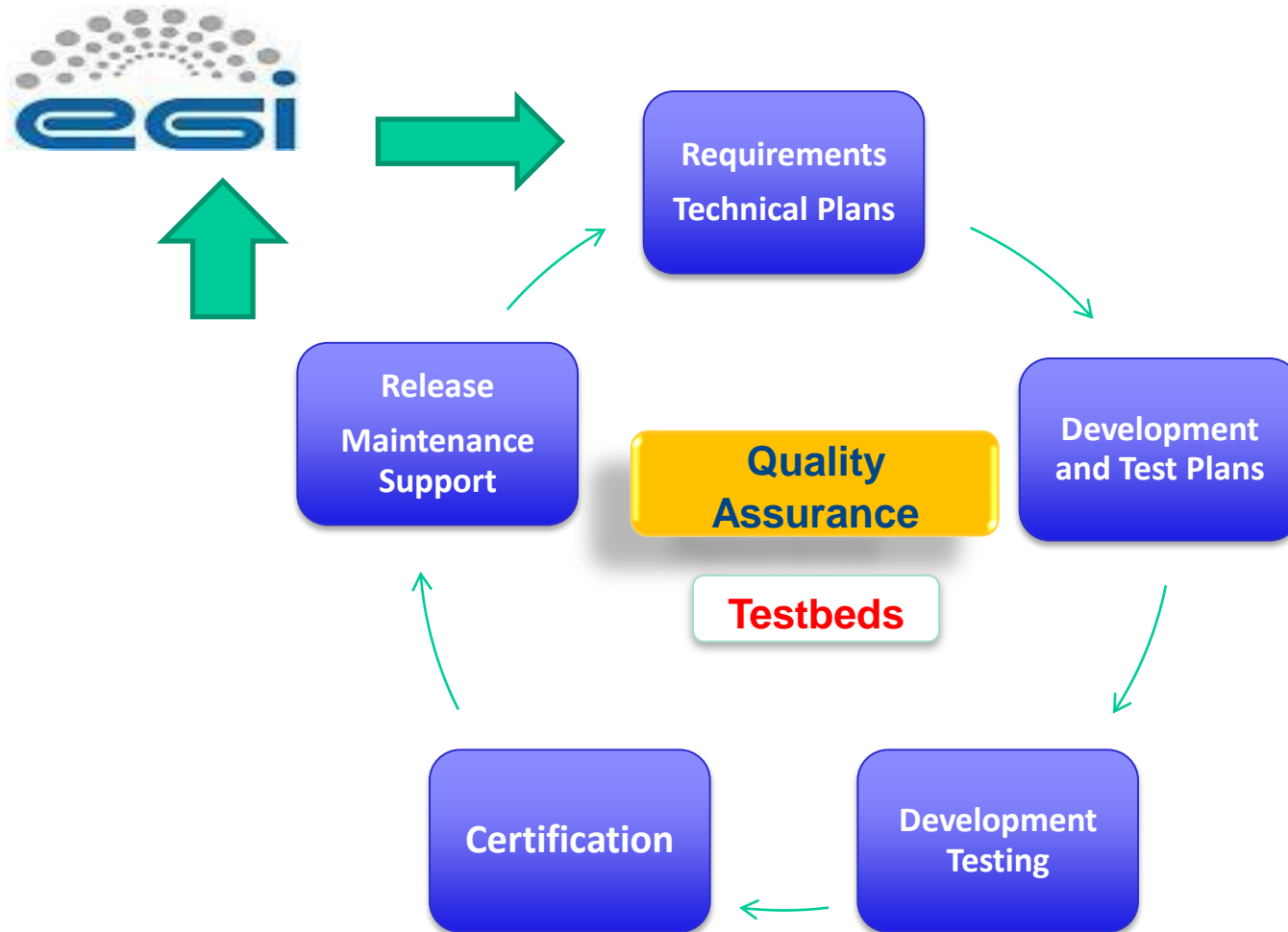
EUROPEAN MIDDLEWARE INITIATIVE

EMI Inter-component and Large Scale Testing Infrastructure

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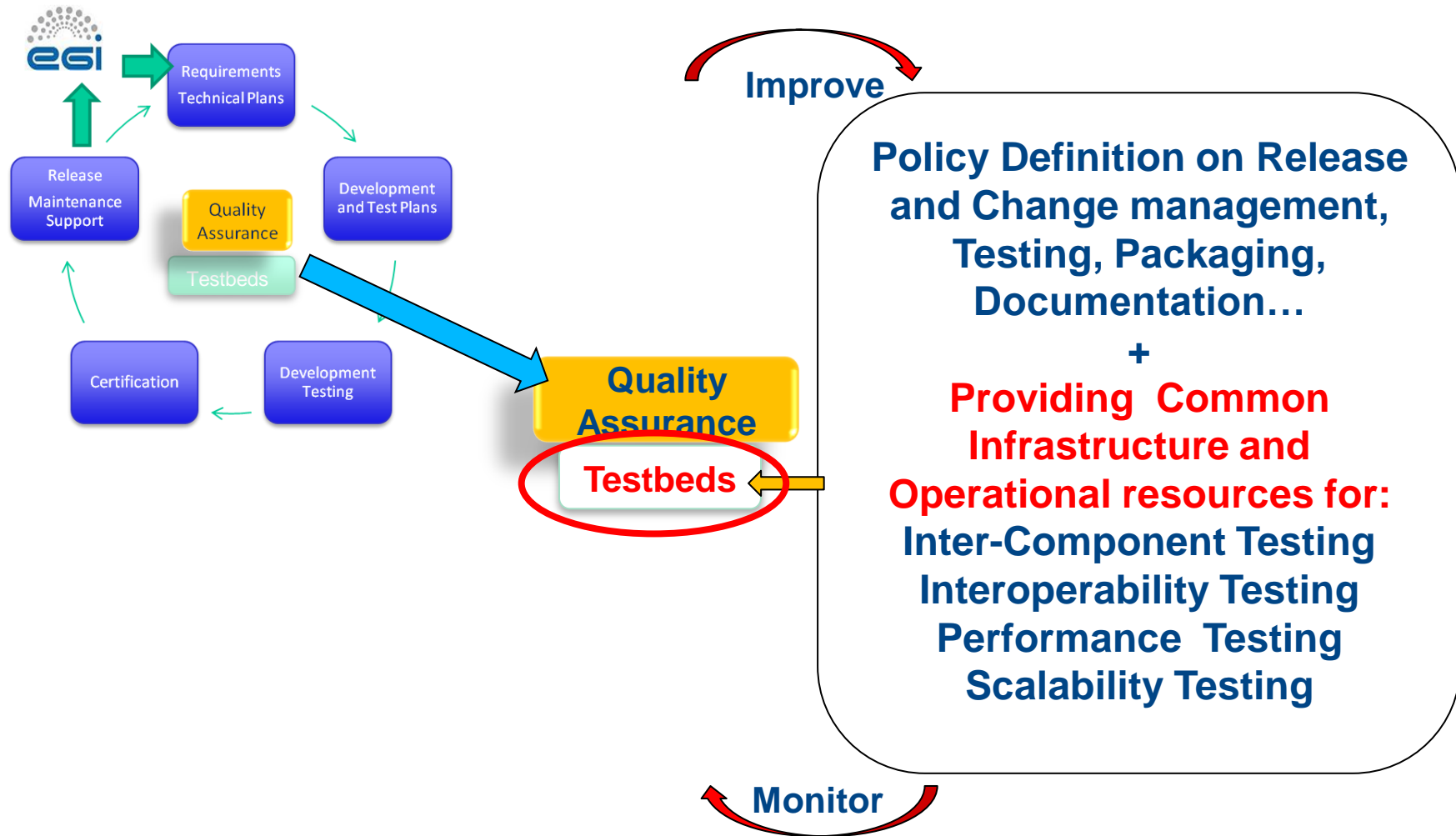
- **Background on EMI certification and testing process:**
 - Role of Testing Infrastructure within Quality Assurance
 - Product Team (PT) – centric model
- **Product Inter-Component Testing Infrastructure:**
 - Interaction zone across PTs components
 - Approach, solutions and remarks
- **Large Scale testing**
 - Interaction zone between PTs and production environment
 - Approach, solutions and remarks
- **Conclusion**

EMI Release Cycle



- Major Releases (1/year, backward-compatibility may be broken)
- Minor Releases (no backward-compatibility broken), Revision, Emergency

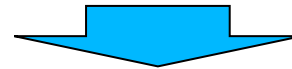
Role of Quality Assurance and Testing Infrastructure



Testing and Certification Process

Component in Certification

Release Candidate:
Successful tests (Unit,
Functionality, Regression...)
& QC Verified:



**DEPLOYED ON EMI TESTING
INFRASTRUCTURE TO
PERFORM:**

Component C_x
Testing in
isolation
performed by
Product Team
PT_x

QC Verification

Inter-Component Testing C_x vs C_y, C_z
performed by **PT_{x,y,z}**
(MANDATORY)

**Large Scale Testing C_x in production like
environment performed by PT_x and
participating user communities**

Release Manager

Released

EMI Testing Infrastructures

I

Inter-Component
Testing **Cx vs Cy,**
Cz performed by
PTx,y,z

- In place since EMI II quarter, **already working** and in use

II

Large Scale Testing
Cx in production like
environment
performed by **PTx**
and participating
user communities

- **Under construction** as approaching EMI-1 release, preliminary contacts with sites

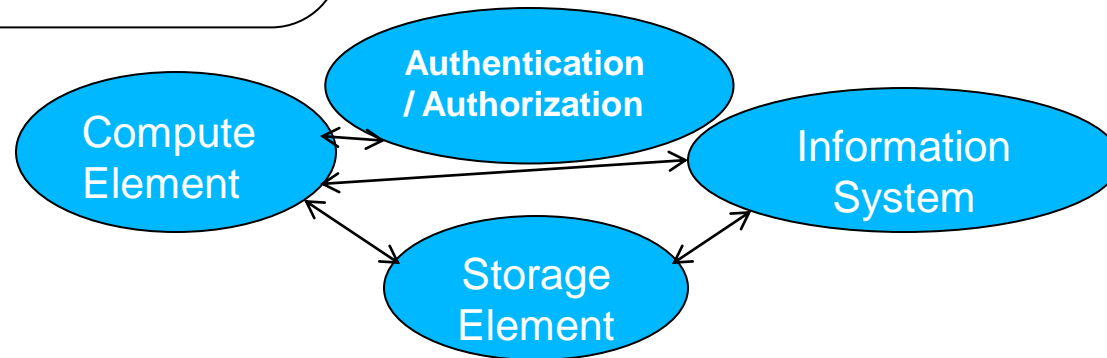
Inter-component Testing Infrastructure

PT X:

Compute Element is Ready for Production... well to assure that I need a preview of other components **CE** interacts with to run some inter-component tests

PT Y:

Storage Element is Ready for Production... but I need a preview of **CE** to run integration tests...



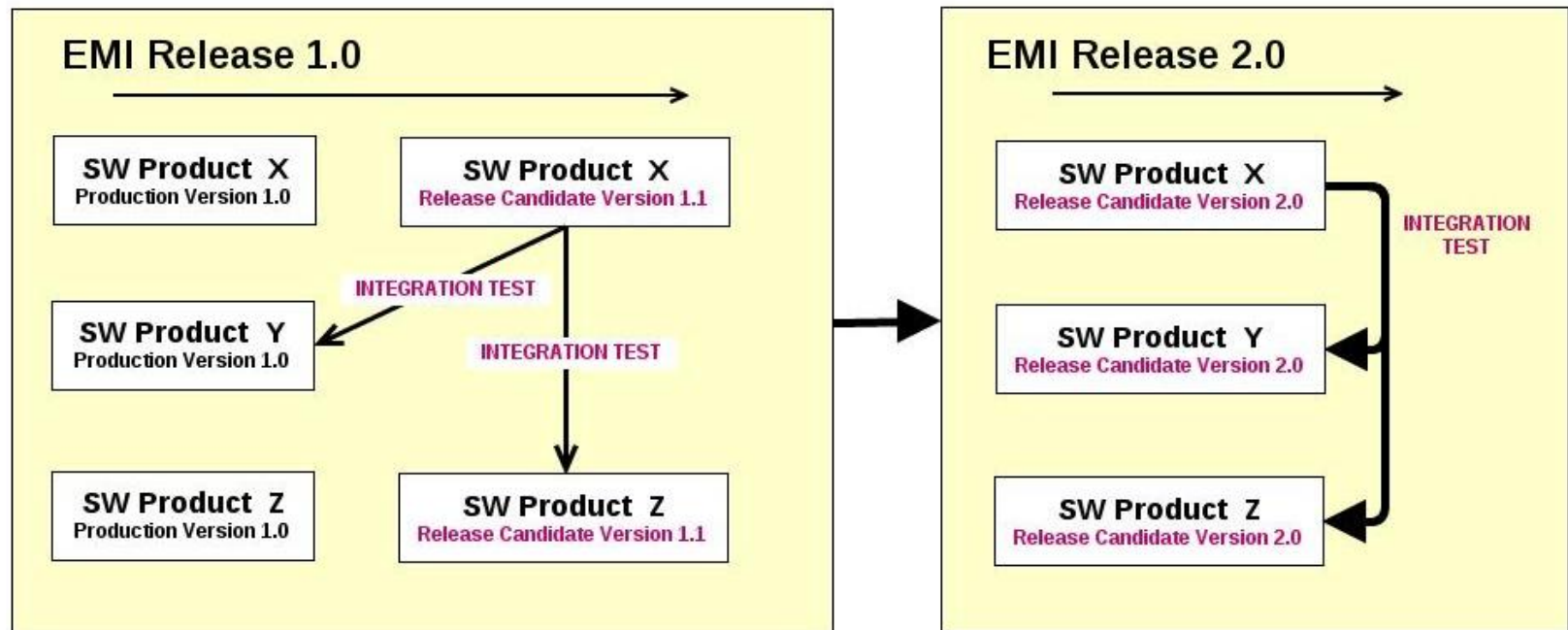
GOAL:

Provide common infrastructure for inter-component tests, i.e. functionality tests focusing on the **interaction** among different **client** and **provider components** provided from **different Product Teams**

Inter-component Testing Scenarios

Inter-component testing for a minor/major release imply to deploy for all Releases/Platforms/Components:

- Production Versions, i.e. released versions (for backward-compatibility too..)
- Release Candidate Versions, i.e. pre-intercomponent testing successful and verified

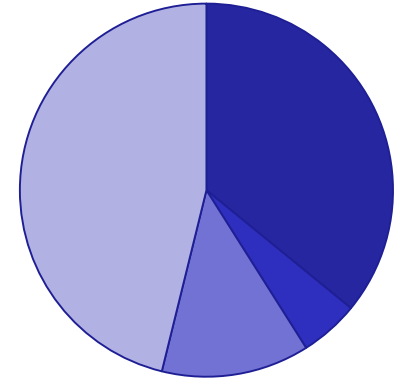


Inter-component Testing Infrastructure: this is in place



HW Resources ~90 instances deploying pre-EMI + EMI1 RC versions

- ARC (Kosice, NIIF)
- dCache (DESY)
- UNICORE (Juelich)
- gLite (CERN, INFN, CESNET)



Monitoring: Nagios, service availability, service probes not for all services

Testers VO: testers.eu-emi.eu

Support: GGUS, with EMI-Testbed Support Unit

Documentation: <https://twiki.cern.ch/twiki/bin/view/EMI/TestBed>

Inter-component Testing Infrastructure: usage

- **Access:**

- Middleware **User Interface** + **testers.eu-emi.eu** certificate needed
- HOWTO see Resources
 - ARC: `ldapsearch -h arc-emi.grid.upjs.sk -p 2135 -x -b 'mds-vo-name=ARC-EMI,o=grid' -s base giisregistrationstatus`
 - gLite + dCache: `ldapsearch -x -H ldap://certtb(rc)-bdii-top.cern.ch:2170 -b mds-vo-name=local,o=grid`
 - UNICORE: `https://zam052v01.zam.kfa-juelich.de:8080/EMI-REGISTRY(-DEV)/services/Registry?res=default_registry`

- **Availability:**

- II - EMI Quarter (avg > 89,7%) ; III - EMI Quarter (avg > 98.3%)

- **Current Usage:**

- Snapshot of pre-EMI + EMI1 RC (work-in-progress) middleware
- EMI-1 RC testing
- EGI training partially on these resources (future pre-view activity??)

Integration Testing infrastructure: remarks

- First *real* meeting place for components
- Fast **growing** and **varying** snapshot of “Maintained Releases” components:
 - No redundancy, most common deployment
 - Not fit for performance/scalability tests
- Coordination in deployment schedule is needed
- Cross middleware integration in initial phase
- Who run the tests?
 - PT do not want to run other clients tests and do not want their certification to depend on others...
 - Use automatic probes (Nagios ?) will help in future...

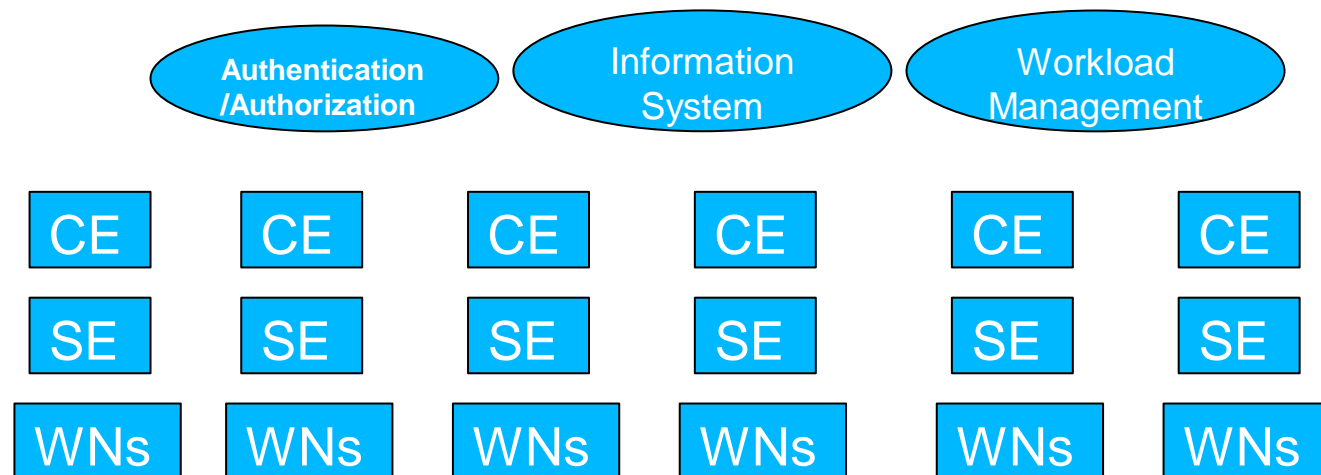
Large Scale Testing Infrastructure

EMI:

CE, SE, Information Authorization Systems...
passed certification and inter-component tests:
Ready for Production... well, testing it on a
larger scale would better validate!

User Community:

I want EMI Components to
work in my usual production
environment whatever I do



GOAL:

Provide an infrastructure for **large scale acceptance, scalability and interoperability testing** of EMI components. The focus is on stressing the service **reproducing** real **production environment**.

Large Scale Testing

Relevant Questions:

How large is large enough? -> Need to be specific in defining the scale

What makes a testbed representative of production environment? -> Need to involve User Community / Sites

How do we want to stress the service? -> Need to take into account PT test plans and consistently define test cases

Which particular combination of services do we need to test? -> Need a flexible infrastructure adaptive to complex testing scenarios

Large Scale Infrastructure Scenarios



a) Pre-Deployment :

- Deployment: common deployment on voluntary sites of RC versions
- Usage: service exposition to usage in production environment.
- Expected Results: get early feedback and large scale validation.

b) Demand and Supply :

- DEMAND: Product Teams / Technical Area Leaders submit a request describing the test and testing scenario.
- SUPPLY: A community of EMI partners available to participate to specific tests campaigns with X effort, Y resources for Z time to test P1, P2,..., PN product.
- Expected Results: implement complex large scale testing scenarios

Example of *on Demand* Testbed: Argus testing case



Testing Use Case	<p>Evaluate Argus integration in CREAM CE and SEs (optional)</p> <p>Scalability under concurrent requests from WNs, CEs</p> <p>Global banning list + VO level (Optional) across multiple sites</p>
Testbed Required Resources	<p>Minimal number of sites: 2</p>
EMI Components involved (EMI-1 RC, SL5 /64, EPEL)	<p>ARGUS (1 /site; Top-level PAP , Site-level PAP , VO-level PAP (optional); VOMS (1- central EMI) ; CREAM (2/site); Glexec -Enabled WN(2 /CE); SE (optional);</p>
Configuration Requirements	<p>CREAM, gridftp, gLexecWN callout to Argus (site level)</p> <p>Argus site PAP policy import from Top-level Argus PAP</p> <p>Fake CA (generated with https://arc-emi.grid.upjs.sk/instantCA) testers.emi-eu.emi enabled</p>

Large Scale Testing Infrastructure (we're working on it...)



- **We have:**
 - Increasing list of component to deploy CE, SE, WMS/LB, ARGUS...
 - Catch-All VO for testing purposes **testers.emi-eu.eu**
 - Operational + Central services (voms, information system)
 - Documentation and process description:
<https://twiki.cern.ch/twiki/bin/view/EMI/LargeScaleEMITestbed>
- **We look for:**
 - Volunteer sites to deploy products
 - User communities for testing

Large Scale Infrastructure: remarks

- *Not mandatory part of Release Process*
- *Adverts for Sites and User Communities:*
 - *JOIN US !!! [mail-to: emi-sa26@eu-emi.eu](mailto:emi-sa26@eu-emi.eu)*
 - *CO-INTEREST: looking for motivated contributors bringing real use cases experience*
- *VOs and Information system:*
 - *testers.emi-eu.eu VO + shared pool of VO (??) on the testbed*
 - *central information system to publish resources*

Conclusion

- Inter-component testing Infrastructures (PT<->PT):
 - Fast growing and changing snapshot of the Maintained Releases
 - ~90 instances **in place**, pre-EMI + EMI-1 RC
 - Access: UI + testers.emi-eu.eu VO + information systems (prod.+ RC)
 - Future work on automation of basic inter-component testing
- Large Scale Testing Infrastructures (EMI-product<->User Community):
 - We have: increasing list of products to deploy + operational tools
 - We look for volunteer sites to deploy products and user communities experience to test them
 - Representativeness of production environment and scale is the key aspect
 - Demand/Supply model provides flexibility to implement complex testing scenarios
- Product quality also results from coordination/cooperation in testing between (**providers <-> clients**)



Thank you!

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