Bottlenecks:
Automated Design/Configuration Evaluation

Background

- **Challenges**
  - It is difficult to find the system bottlenecks in terms of software and hardware
  - many of systems go through a detailed staging process that is mostly manual, complex and time-consuming
  - During the staging process the system to be produced is subjected to workloads to determine whether it will meet the production workloads
  - Finally, data gleaned from the staging process can be re-used to guide future designs and for management of system during operations
  - Before submitting the infrastructure to production environment，it is needed to test and verify the infrastructure
- **Current approaches**
  - the real workload to the deployed system is analyzed on-line and corresponding measurements are taken

motivation

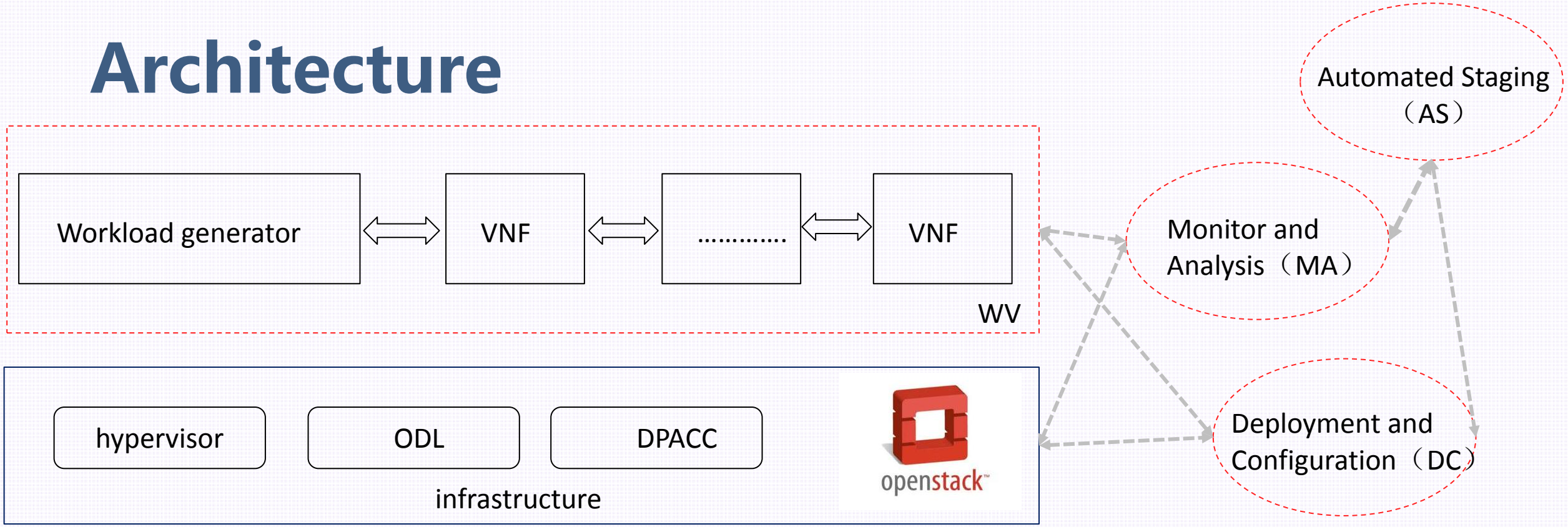
- Try to find system bottlenecks by testing and verifying OPNFV infrastructure in a staging environment before committing it to a production environment

- to have an automatic method for executing a benchmark on the deployment plan to validate the deployment during staging, instead of debugging a deployment during production use

Approach

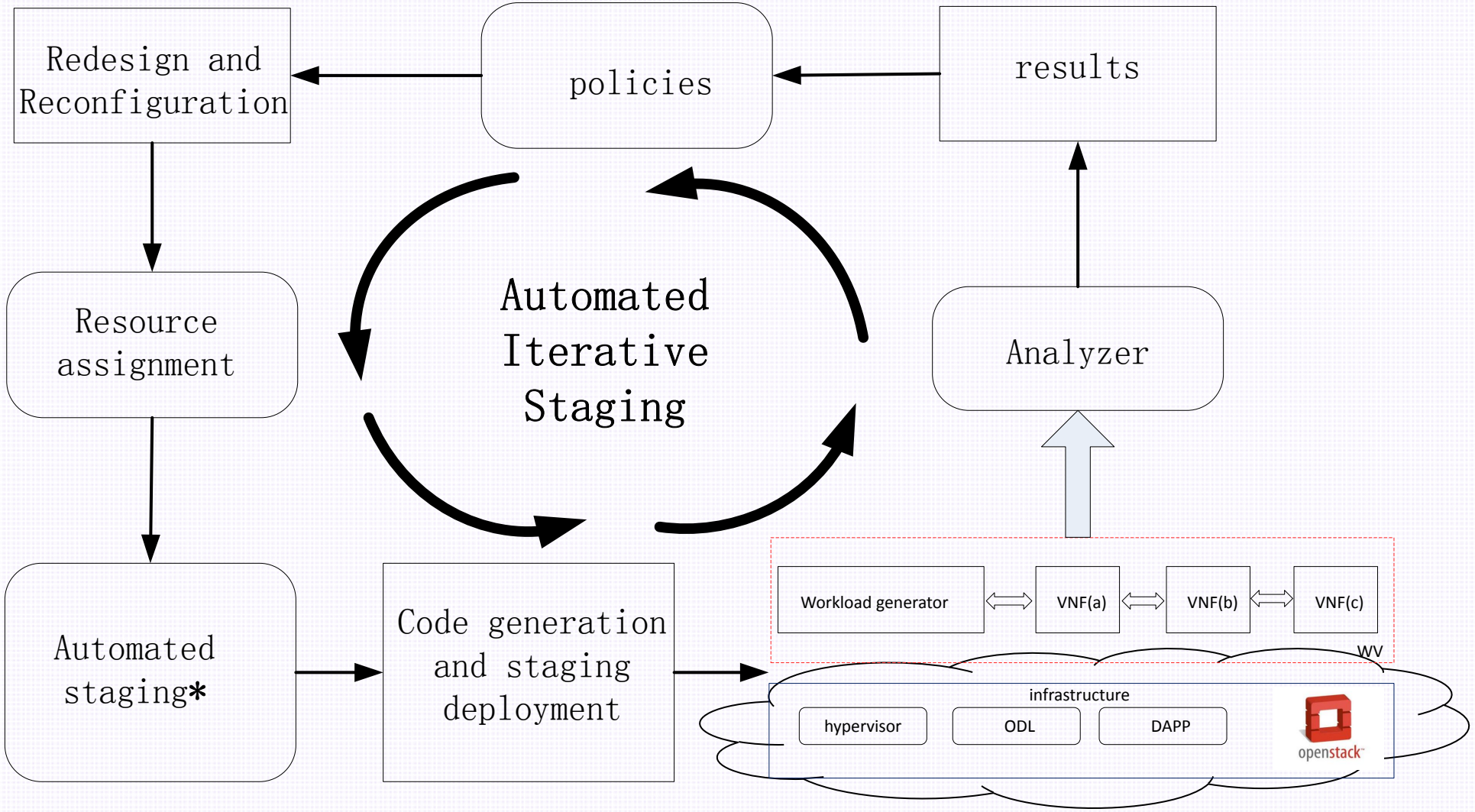
- Create a powerful staging framework
- Automatically generate the full set of experimental specification and code
- measure the performance of standard benchmarks over a wide range of hardware and software configurations

Architecture



- Workload generator and VNFs (WV) : workload generator generates workloads which go through VNFs
- Monitor and Analysis (MA) : monitor VNFs status and infrastructure status to output analyzed results
- Deployment and Configuration (DC) : deploy and configure infrastructure and WV
- Automated Staging (AS) : implement automated staging

stages


Redesign and Reconfiguration
policies
results
Resource assignment
Automated Iterative Staging
Analyzer
Automated staging*
Code generation and staging deployment
Workload generator
VNF(a)
VNF(b)
VNF(c)
WV
infrastructure
hypervisor
ODL
DAPP
openstack

Scope

- Provide framework, methods, codes and test cases to test and verify all kinds of bottlenecks in infrastructure

Use case

- Software bottlenecks
- Hardware bottlenecks
- ……

Dependencies

- Installers in “BGS” provide the framework foundation to be tested in Infrastructure layer.
- Octopus provides the continuous integration test.
- Bottlenecks will consider the outputs of “Yardstick”, “Funtest”, “VSPERF DPACC” and “Q-Tip”.
- Configuration methods of the upstream software, such as .conf, json files

Related projects

- **VSPERF:** Virtual Switch Performance
- **Q-Tip:** performance characterization of NFVI bottom-up in white-box
- **DPACC:** Hardware-assisted Data Plane Acceleration
- **Functest :**
  - Rally Bench，Tempest， vPing， vIMS， SDN Controller suite， CI automation
- **Yardstick: NFVI verification from VNF perspective**
  - offers both functional and performance test cases addressing the whole system (where Rally for instance is more used for OpenStack and Robot used for ODL)
  - Good fault isolation to be able to identify/detect faults early (usecase: Fault injection)
- **BGS :** as installers

Planned deliveries

- Framework
- Test cases
- Diagrams showing the test results
- Reference documents
- BP and Codes for upstream such as ODL，KVM，Openstack
- ……

thanks