



**zentyal**

# **ANSTE**

*Advanced Network Service Testing Environment*

2nd of February 2014

# *Context*

# Zentyal Server

- Zentyal is a drop-in replacement for Microsoft Small Business Server and Microsoft Exchange Server
- But not only that...
  - Gateway & UTM
  - Infrastructure Server
  - Office Server
  - Communications Server

# Testing a complex stack

- Based on Ubuntu Server
- Integrate other packages and customize configuration
- Ubuntu updates can break integration
- Other external dependencies:
  - Squid/Dansguardian rules
  - Snort/Suricata rules
  - Spamassasin rules



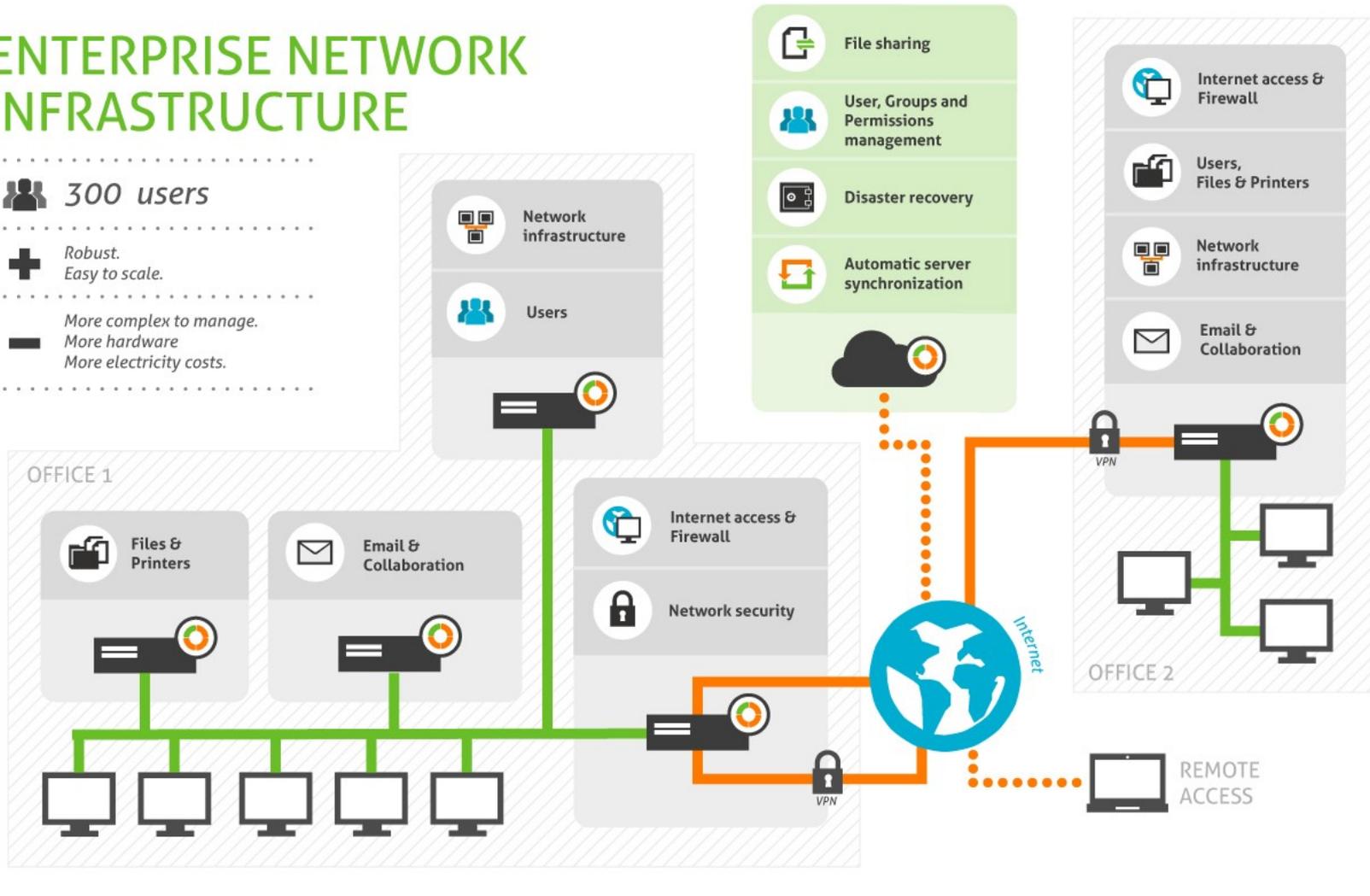
# Testing complex scenarios

## ENTERPRISE NETWORK INFRASTRUCTURE

 300 users

 Robust.  
Easy to scale.

 More complex to manage.  
More hardware  
More electricity costs.



# Testing in Zentyal

- **Unit testing** → ✓
- **Integration testing** → ✓
- **Functional testing** → ?

# *Solution*

# ANSTE

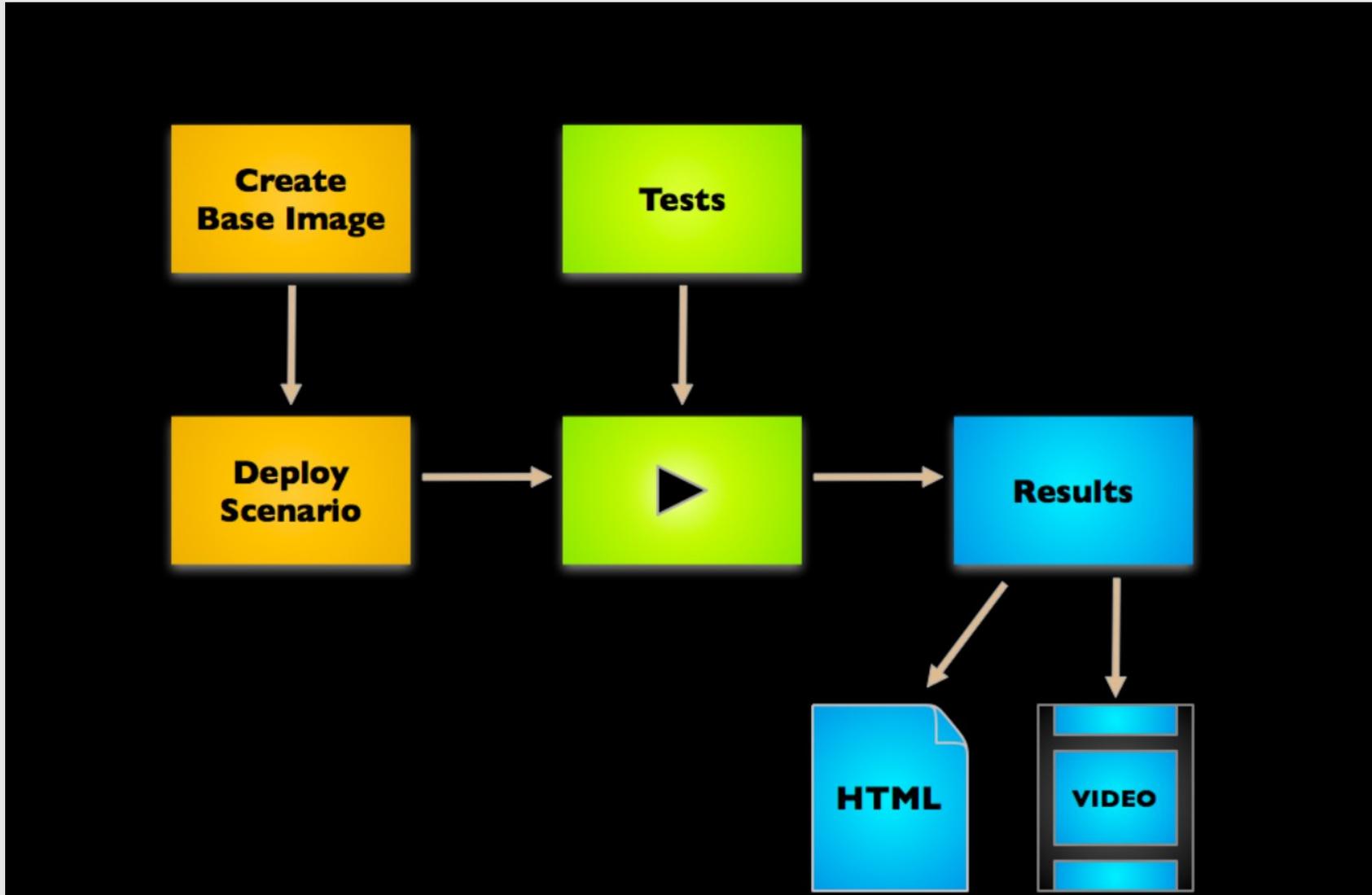
- Advanced Network Service Testing Environment
- 2007
- Open source tool - GPL
- Written in Perl
- Virtualization Backends
  - Libvirt (KVM)
- Scenarios/Tests Format - YAML
- Code - <https://github.com/Zentyal/anste>



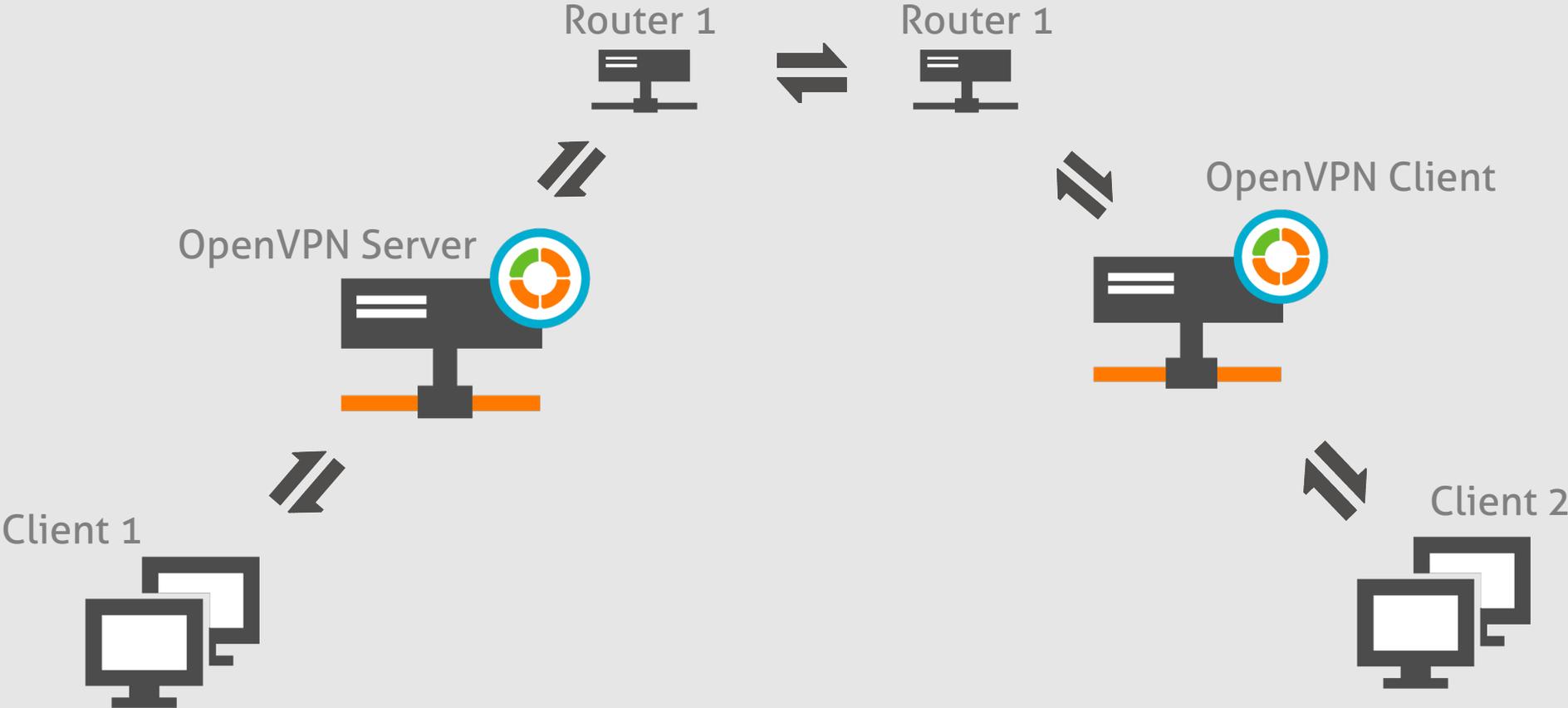
# What ANSTE does?

- **Deploy Scenarios**
- **Run tests**
- **Gather results**

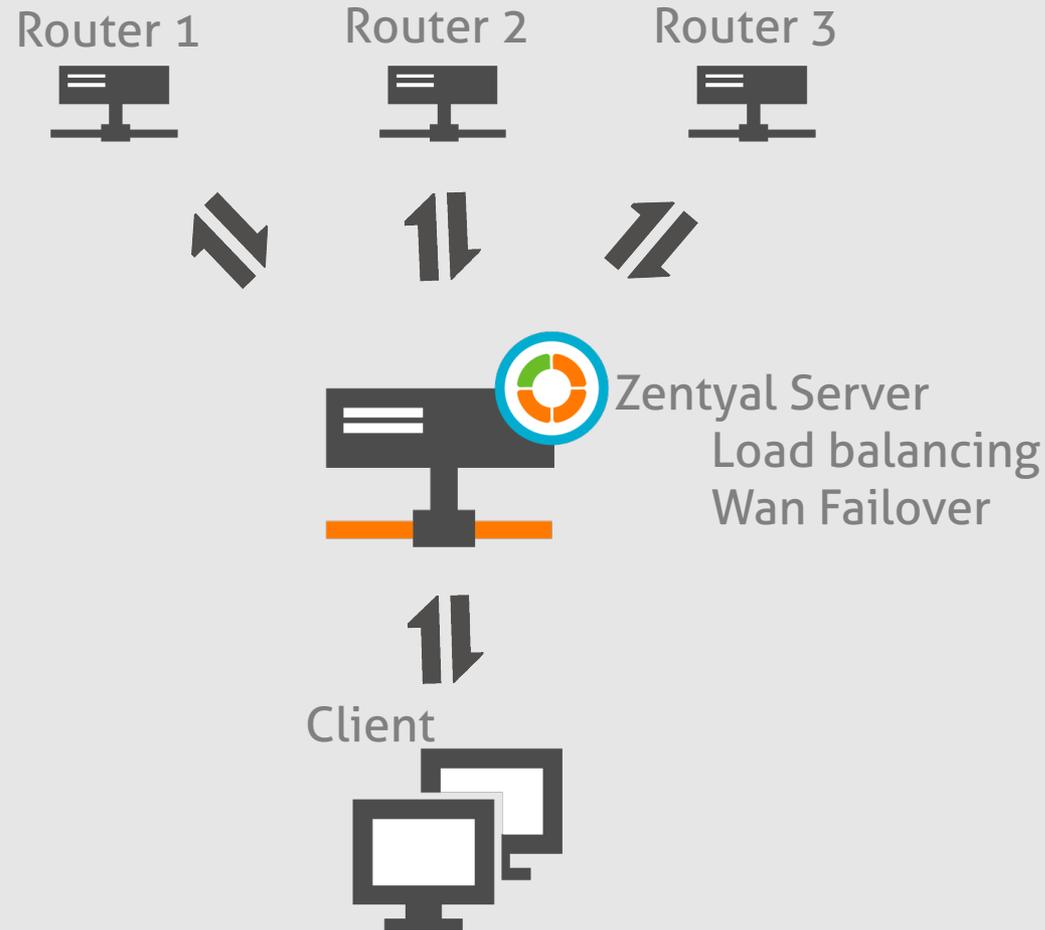
# What ANSTE does?



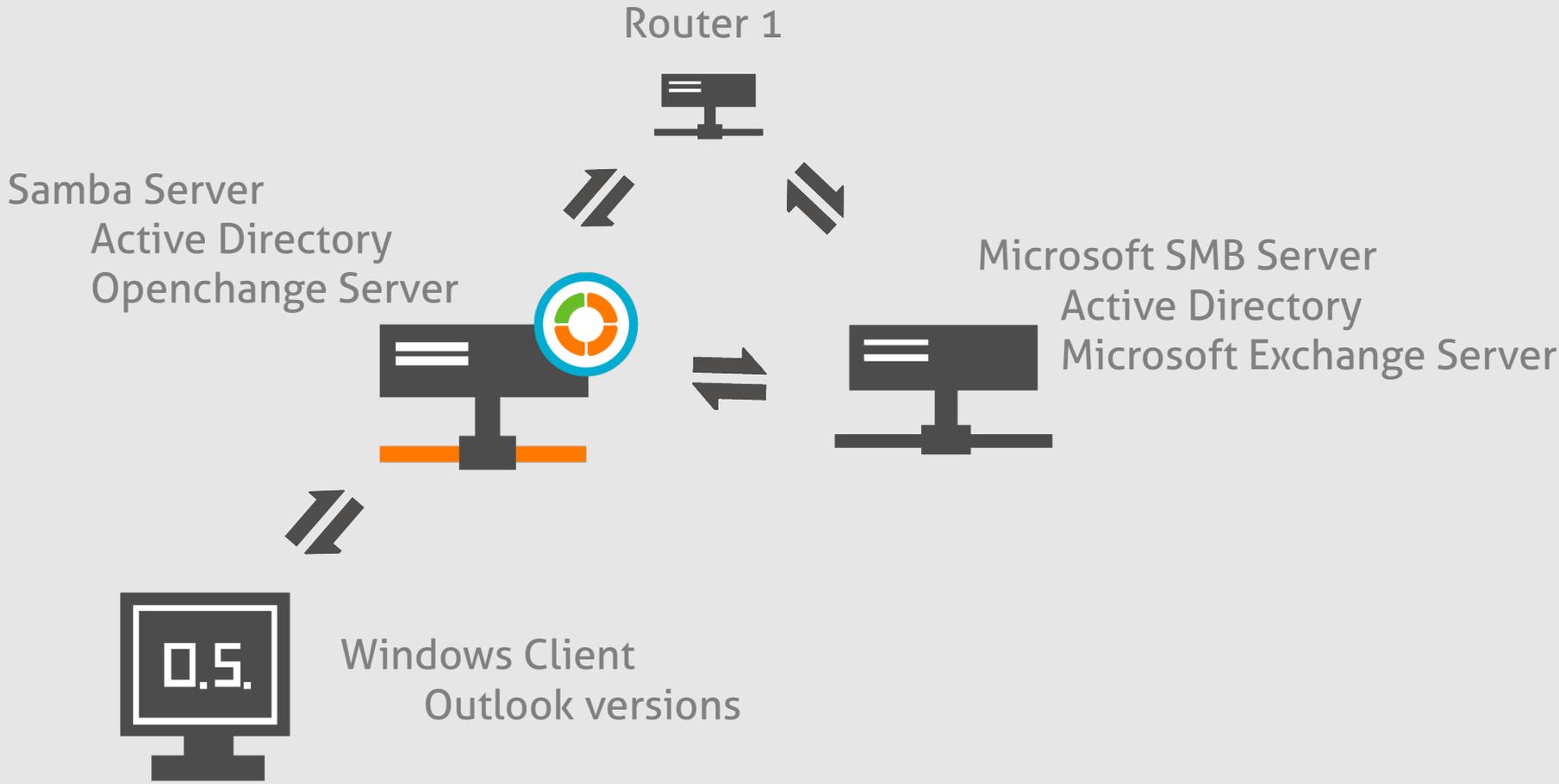
# Example of testing scenarios



# Example of testing scenarios



# Example of testing scenarios



# *Internals*

# Create base Image

- **Ubuntu base images**
  - **Created with ubuntu-vm-builder**
  - **Added a daemon to receive tests and check status**
  - **Package list installation**
  - **Configuration and provisioning via script**
- **Support for “raw” images (ALPHA)**
  - **Any other OS**
  - **Only launch**
  - **Already setup**

# Create base Image

```
name: precise-mini
desc: Ubuntu Precise
memory: 256
size: 1150
method: debootstrap
dist: precise
pre-install:
  - conf-apt-cacher.sh
  - write-precise-sources.sh
packages:
  - openssh-server
  - wget
  - smbclient
post-install:
  - install-last-wget-version.sh
```

```
name: precise-zentyal-3.3
desc: Ubuntu Precise with Zentyal
memory: 2000
size: 3000
method: debootstrap
dist: precise
packages:
  - vim
  - strace
  - apt-transport-https
  - apparmor
  - zentyal
  - debug
pre-install:
  - conf-apt-cacher.sh
  - write-precise-zentyal-sources-3.3.sh
  - install-mysql.sh
files:
  - webadmin.preservice
post-install:
  - set-english-language.sh
  - ssl-cert-workaround.sh
  - delete-first.sh
  - force-package-install.sh
  - add-anste-firewall-rule
  - ebox-same-cert.sh
  - config-auto-login.sh
  - ebox-set-debug-on.sh
  - zentyal-ignore-anste-iface.sh
post-tests:
  - check-zentyal-log
  - check-syslog-apparmor
```

# Deploy Scenario

- **Create network**
  - **Complex network**
  - **Virtual interfaces**
- **Launch Images**
  - **Configuration scripts**
    - **Pre-populate data**
    - **Configure basic services**
  - **Special types:**
    - **Router → Special config (DHCP, PPPOE, ... )**

# Deploy Scenario

```
name: Zentyal to Zentyal OpenVPN Test Scenario
desc: Two Zentyal with one router and one internal machine each.
hosts:
  - name: router-a
    type: router
    desc: Host that acts like a router
    baseimage: {$dist}-mini
    network:
      interfaces:
        - name: eth1
          type: static
          address: 192.168.3.2
          netmask: 255.255.255.0
        - name: eth2
          type: static
          address: 192.168.4.2
          netmask: 255.255.255.0

  - name: router-b
    type: router
    desc: Host that acts like a router
    baseimage: {$dist}-mini
    network:
      interfaces:
        - name: eth1
          type: static
          address: 192.168.5.2
          netmask: 255.255.255.0
        - name: eth2
          type: static
          address: 192.168.4.3
          netmask: 255.255.255.0
```

# Deploy Scenario

```
name: Zentyal and client
desc: One Zentyal machine and a user cliente machine
manual-bridging: 1
bridges:
  - id: 2
    address: 192.168.2.254
  - id: 3
    address: 192.168.3.254
hosts:
  - name: zentyal-server
    desc: Zentyal Server
    baseimage: {$dist}-zentyal{$image}
    network:
      interfaces:
        - name: eth1
          type: static
          bridge: 2
          address: 192.168.2.1
          netmask: 255.255.255.0
        - name: eth2
          type: static
          bridge: 3
          address: 192.168.3.1
          netmask: 255.255.255.0
          gateway: 10.6.7.1
    pre-install:
      - conf-apt-cacher.sh
      - dist-upgrade-packages{$script}.sh
    post-install:
      - zentyal-import-network.pl
      - wait-start-apache.sh
```

# Deploy Scenario

```
- name: dhcp-router
  type: dhcp-router
  desc: Host that acts like a DHCP router
  baseimage: {$dist}-mini
  network:
    interfaces:
      - name: eth1
        type: static
        address: 192.168.2.1
        netmask: 255.255.255.0
        bridge: 2

- name: pppoe-router
  type: pppoe-router
  desc: Host that acts like a PPPoE router
  baseimage: {$dist}-mini
  network:
    interfaces:
      - name: eth1
        type: static
        address: 192.168.2.1
        netmask: 255.255.255.0
        bridge: 2
```

# Deploy Scenario

```
- name: WinXP
  desc: Windows XP
  baseimage: WinXP
  baseimage-type: raw

- name: Windows7
  desc: Windows 7
  baseimage: Windows7
  baseimage-type: raw

- name: Win2k3
  desc: Windows Server 2003
  baseimage: Win2k3
  baseimage-type: raw
```

# Run Tests

- Any scripting language (Bash, Perl, Python, ...)
- Special types of tests: (selenium/webdriver, reboot, ...)
- Run in any of the machines
  - Even the host machine
- Different modes:
  - Step by step → Debugging
  - Breakpoints
  - Wait on failure

# Run Tests

```
name: Zentyal to Zentyal tunnel OpenVPN tests suite
desc: Tests to ensure that Zentyal OpenVPN module works ok.
scenario: openvpn/zentyal-to-zentyal.yaml
tests:
  - name: BasicConfigServer
    type: web
    desc: Remove default gateway, set interface as external, enable modules, add new gateway and set certificates.
    host: zentyal-server
    script: basic-config
    vars:
      NAME: default
      IFACE: "eth2"
      MODULES: firewall logs openvpn
      IP: "192.168.3.2"
      DEFAULT: "True"

  - name: ConfigVPNServer
    type: web
    desc: Configure VPN server in the Zentyal server
    host: zentyal-server
    script: config-vpn-server

  - name: DeleteAdvertisedNetwork
    type: web
    desc: Delete advertised network in the Zentyal server
    host: zentyal-server
    script: delete-advertised-network
    vars:
      SERVER: "foobar-server"
      NETWORK: "10.6.7.0"
```

# Run Tests

```
#!/usr/bin/env python

import zentyal

driver = zentyal.driver()
server_name = driver.var('SERVER', 1)
advertised_network = driver.var('NETWORK', 1)

driver.open('/CA/Index')
driver.go_to('VPN -> Servers')

driver.table_filter('Servers', server_name)
xpath_exposed_networks = "//div[@id='Servers']//a[contains(@href,'ExposedNetworks')]"
driver.click(xpath=xpath_exposed_networks)

driver.wait_for(name='ExposedNetworks')
driver.table_filter('ExposedNetworks', advertised_network)
driver.click(xpath="//div[@id='ExposedNetworks']//button[@name='del']")

deleted_xpath = "//div[@class='note' and text()='Advertised network deleted']"
found_deleted = driver.wait_for(xpath=deleted_xpath)
driver.assert_true(found_deleted)
```

```
#!/bin/bash

echo "Expecting foo on $HOST:1100"

for i in `seq 1 30`
do
    nc $HOST 1100 | grep "foo"
    if [ $? != 0 ]
    then
        echo "$i try"
        sleep 1
    else
        echo "Success"
        exit 0
    fi
done

exit 1
```

# Gather results

- **Auto-generated reports**
  - **Basics easy to read HTML reports**
  - **XML reports for CI integration (Jenkins)**
- **Record video & Image capture**
  - **For web UI tests**
  - **recordmydesktop**

# Gather results

## Zentyal OpenChange tests

Contains a set of tests to check that the Zentyal OpenChange module works properly.

Test	Description	Result
InstallNonProfilePackages	Install additional packages	OK ( <a href="#">script</a> )
EnableModules	Enable modules.	OK ( <a href="#">script</a> )
CreateVDomain	Create the virtual mail domain	OK ( <a href="#">script</a> )
SaveChanges	Save the changes.	OK ( <a href="#">script</a> )
AddUser	Adds a user	OK ( <a href="#">script</a> )
Provision	OpenChange provision and enable all users account	OK ( <a href="#">script</a> )
LoginUser1	Log into roundcube with user1 and then logout	OK ( <a href="#">script</a> )
Mail	Access the main mail screen	OK ( <a href="#">script</a> )
ComposeMail	Access the compose mail screen	OK ( <a href="#">script</a> )
AddContactZentyal	Adds a contact in Zentyal	OK ( <a href="#">script</a> )
check-zentyal-log	PostTest added from the baseImage of the host zentyal-server	ERROR ( <a href="#">script</a> )

# Gather results

## Test Result : Zentyal Network Multi-Gateway Tests

0 failures (±0)

11 tests (±0)

[Took 1 min 47 sec.](#)

[add description](#)

### All Tests

Test name	Duration	Status
<a href="#">AddGateways</a>	16 sec	Passed
<a href="#">ConfigMultiGateway</a>	26 sec	Passed
<a href="#">ConfigNetwork</a>	6 sec	Passed
<a href="#">DumpRoutes</a>	1 sec	Passed
<a href="#">DumpRoutes2</a>	1 sec	Passed
<a href="#">EnableBalance</a>	6 sec	Passed
<a href="#">EnableModules</a>	26 sec	Passed
<a href="#">TestBalanceRouterA</a>	12 sec	Passed
<a href="#">TestBalanceRouterB</a>	11 sec	Passed
<a href="#">check-syslog-apparmor</a>	1 sec	Passed
<a href="#">check-zentyal-log</a>	1 sec	Passed

# *What's next ?*

# What's next...

- **Integration with OpenStack**
  - **On its way...**
- **Improving Windows integration**
  - **Windows service for ANSTE**
  - **Sikuli integration**
  - **Windows automatic provision**

# We are hiring!!!

- **Two open positions:**
  - **R&D Senior C/C++ Developer**
  - **R&D Junior C/C++ Developer**
- **[www.zentyal.com/company/careers/](http://www.zentyal.com/company/careers/)**



# Questions?

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