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Test Environment and Data Requirements   
for Application Gateway

This document elaborate the test environment and data requirements to effectively test Application Gateway

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| Document ID: 01 | Version: v1.0 |
| Last saved by: Minh Ly | Last saved: 2016/Dec/24 |
| Status**:** Draft | Document Classification: Internal Use Only |



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SUMMARY OF REVISIONS

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| --- | --- | --- | --- |
| **Version** | **Date** | **Author(s)** | **Comments** |
| v1.0 | 2016/12/24 | Minh Ly | Initiate document |
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TERMS AND ABBREVIATIONS

|  |  |
| --- | --- |
| **Term** | **Description** |
| **Virtual server** | The term “virtual server” here is used to describe port-forwarding where the internal and external port numbers are the same. ‘Port-forwarding’ term is used where the external and internal port numbers are different. |
| **RSTP** | The Real Time Streaming Protocol (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. |
|  |  |

# Introduction

This document will present and describe in details the test bed necessary for testing the application gateway (AG).

## Purpose

Provide the test environment and test data in details to prepare for:

+ Functional testing

+ Integration testing

+ System testing

+ Automation testing for both webpage and command line interface

## Scope

This document describes the test bed for testing below feature list:

+ Switching, VLAN

+ Routing: static routing, dynamic routing with protocol supported: RIPv2, OSPF

+ Network services: DHCP, PORT Forwarding, Virtual server.

+ Firewall: MAC filtering, Packet Filtering, Content Filtering

+ Wi-Fi: support 802.11/a/b/g/n, with WEP, WPA and WPA2

+ Support real-time streaming protocol

+ Management: support syslog, remote syslog and upgrade firmware

## Reference

Test Plan for Application Gateway

# Test Environment Details

This section will details the requirements, setup, limitations and maintenance for test environment required for effective testing of the project

## Test Environment Requirements

For each part of table below is requirement for one testing functional / system. The details of environment setup and configuration present in *2.2 Test Environment Setup*.

|  |  |  |
| --- | --- | --- |
| **Test level** | **Feature to be tested** | **Hardware/software needed** |
| Functional Testing and Integration Testing | Switching | * AG device: 1x * Cisco Catalyst 2950 Series Switches: 1x * Workstation: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark 2.2.3 |
| VLAN | * AG device: 1x * Cisco Catalyst 2950 Series Switches: 1x * Workstation: 3x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark 2.2.3 |
| Routing | * AG device: 2x * Cisco Catalyst 2950 Series Switches: 1x * Linksys E2500 Router: 1x * Workstation: 4x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark 2.2.3 |
| Network services | * AG device: 2x * Linksys E2500 Router: 1x * Mobile device: iPhone 5 / Google Nexus 7 * Workstation: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark 2.2.3 * Web server / FTP server: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: CentOS 6.5 * Software: vsftpd, nodejs, npm, tcpdump |
| Firewall | * AG device: 2x * Workstation: 2x * Linksys E2500 Router: 1x * Web server / FTP server: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: CentOS 6.5 * Software: vsftpd, nodejs, npm, tcpdump |
| Wi-Fi | * AG device: 1x * Laptop: 1x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: Wireless Network Adapter supports 802.11/a/b/g/n * OS: Windows 7 64 bit * Software: Wireshark * Mobile device: iPhone 5 / Google Nexus 7 |
| Real-time streaming | * AG device: 1 * Media Server: 1x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 4 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Ubuntu 16 64 bit * Software: VLC * Workstation / Laptop: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark, Chrome, Firefox, Internet Explorer   - Mobile device: iPhone 5 / Google Nexus 7 |
| Management | * AG device: 1 * Workstation / Laptop: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Windows 7 64 bit * Software: Wireshark, Chrome, Firefox, Internet Explorer   - Mobile device: iPhone 5 / Google Nexus 7 |
| System Testing | All features | * AG device: 4x * Mobile device: iPhone 5 / Google Nexus 7   - Workstation: 6x + Laptop: 1x   * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter + Wireless Network Adapter supports 802.11/a/b/g/n * OS: Windows 7 64 bit * Software: Wireshark, Chrome, Firefox, Internet Explorer, Loadrunner * Media Server: 1x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 4 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Ubuntu 16 64 bit * Software: VLC * Web server / FTP server: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: CentOS 6.5 * Software: vsftpd, nodejs, npm, tcpdump * Linksys E2500 Router: 1x * Cisco Catalyst 2950 Series Switches: 1x |
| Automation testing | Webpage and command line interface | * AG device: 1x   - Workstation for automation testing: 1x   * Processor: Intel Core i5-750 or equivalent * RAM: 8 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter and Wireless Network Adapter supports 802.11/a/b/g/n * OS: Windows 7 64 bit * Software: Wireshark 2.2.3, Eclipse IDE, JDK 8, TestNG, Selenium Chrome/Firefox/IE WebDriver, Jenkins, Ant. * AG device: 4x * Mobile device: iPhone 5 / Google Nexus 7   - Workstation: 6x + Laptop: 1x   * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter + Wireless Network Adapter supports 802.11/a/b/g/n * OS: Windows 7 64 bit * Software: Wireshark, Chrome, Firefox, Internet Explorer, Loadrunner * Media Server: 1x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 4 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: Ubuntu 16 64 bit * Software: VLC * Web server / FTP server: 2x * Processor: Intel Core 2 Duo E6700 or equivalent * RAM: 2 GB * HDD: 100 GB * Network: 1000 Gigabit Ethernet Network Adapter * OS: CentOS 6.5 * Software: vsftpd, nodejs, npm, tcpdump * Linksys E2500 Router: 1x * Cisco Catalyst 2950 Series Switches: 1x |

**Table 1 - Test Environment Requirements**

## Test Environment Setup

|  |  |  |
| --- | --- | --- |
| **Features** | **Network diagram** | **Note** |
| Switching | Scenario 1    Scenario 2 | - Scenario 2 diagram tests Switching function on AG device alongside with another switch |
| VLAN | Scenario 1    Scenario 2 | - Scenario 1 and Scenario 2 diagrams test Switching and VLAN functions |
| Routing | Scenario 1    Scenario 2    Scenario 3 | - Scenario 1 tests Routing function  - Scenario 2 tests Switching function on AG device alongside with another router |
| Network services | DHCP – Scenario 1    DHCP – Scenario 2    Port Forwarding    Virtual Server | - Scenario 1 diagram tests DHCP function works when using alongside with another switch  - Scenario 2 diagram tests DHCP function |
| Firewall | MAC filtering    Packet filtering    Content filtering | * Packet filtering diagram tests DHCP and packet filtering. * Content filtering diagram tests DHCP, packet filtering and Wi-Fi |
| Wi-Fi | Scenario 1    Scenario 2 | * Scenario 1 tests Wi-Fi function using mobile device and latop * Scenario 2 tests Wi-Fi, Switching and DHCP function |
| Real-time streaming | Scenario 1    Scenario 2 | * Scenario 1 and scenario 2 diagrams test Wi-Fi, DHCP, Real-time streaming. In addition, scenario 2 diagram also tests AG device can send/receive data from another media server |
| Management | Management | - Management diagram tests Management via different connections (Wi-Fi, Wired, Console port) |
| System testing | System testing | - System testing diagram tests the entire system ‘s behavior |
| Automation testing | Automation testing for webpage and cmd interface    CI testing | - Automation testing diagram tests the product management support page and command line interface via ssh using Selenium and Python scripting  - CI testing diagram smoke test automatically fundamental functions of both webpage and command line interface every time new firmware is available. |

**Table 2 – Test Environment Setup**

# Test Data Details

## Test Data Requirements

Elaborate the requirements for the test data:

|  |  |
| --- | --- |
| Function | Input data |
| Real-time streaming protocol | - Video file  - CD / DVD  - MPEG hardware encoding card  - Transcoding data |

**Table 3: Test data requirements**

## Test Data Maintenance

Testing requirements needs to be maintained to ensure test data remains relevant for testing.

|  |  |  |
| --- | --- | --- |
| Task | Role | Responsibilities |
| Requirement maintenance | QA Manager | Keep new official requirements updated to the test strategy, test plan.  Keep new unofficial requirements updated to Latest Feature Updates workbook. |
| QA | Track bugs, test cases and report to QA Manager new requirement changes |

**Table 4: Test data maintenance**

# Backup

This section elaborates the backup plan for test data:

* Create a full backup for Application Gateway ‘s database on the weekend
* Then on the weekdays, create an incremental backup to save only the files that changed since the last full or incremental backup.
* To restore the data, first restore the last full backup then restore all the incremental backups made since the last full backup, in the order they were made.

# Training

## Training Identified

Training identified is listed in the table below:

|  |  |
| --- | --- |
| Type of Tool/Process | Tool /Process |
| Automation testing library | Selenium 3.0.1 |
| Network monitoring tool | Wireshark 2.2.3 |
| Automation software build tool | Apache Ant 1.9.7 |
| Automation server supports building, deploying and automating project | Jenkins 2.32 |
| Load testing tool | Loadrunner 12.0 |
| Python scripting language | Python 3 |

**Table 5: Training identified**

## Training Materials and Approach

Training is delivered via:

* Self-studies
* Knowledge sharing among peers
* On the job training
* Classroom style training by internal or external domain experts

Training materials will be kept in relevant locations on shared folders.

Refer to below links for tutorials of the necessary software for this test environment:

* Wireshark: <http://www.howtogeek.com/104278/how-to-use-wireshark-to-capture-filter-and-inspect-packets/>
* Selenium: <http://www.guru99.com/selenium-tutorial.html>
* Jenkins: <http://www.tutorialspoint.com/jenkins/>
* Apache Ant: <http://www.vogella.com/tutorials/ApacheAnt/article.html>
* Loadrunner: <http://www.guru99.com/loadrunner-v12-tutorials.html>
* Python: <https://www.tutorialspoint.com/python/>

# Roles and Responsibilities

Roles and responsibilities defined as below for various tasks required in managing Test Environment and Test Data:

|  |  |  |
| --- | --- | --- |
| Task | Role | Responsibilities |
| Test Environment Setup & Maintenance | Sysadmin  QA Manager | Plan, setup and maintain test environment with input from users |
| Test Data Collection & Maintenance | QA,QA Manager | Generate test data |

**Table 6: Roles and Responsibilities for acquiring Test Environment and Data**