IBM Host on Demand Redirector V11.0.7
Performance & Capacity Planning Benchmarking Guide
on AIX for SSL Connection

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1.0 INTRODUCTION

The Redirector is a Telnet proxy that is able to accept connections from clients and pass them on, through a different port, to the next stage in the link. The Redirector can serve as a barrier between clients and the target Telnet server. If you do not want a large number of clients connecting directly to your host system and creating a security risk, you can have the clients connect to one or more redirectors. The redirectors pass the connection on to the host, allowing you to hide the address of the host from the client users. On Windows, AIX, and Linux platforms, the Redirector provides the support for Transport Layer Security (TLS) or Secure Sockets Layer (SSL) security between clients and the server

The Figure below shows the working of the redirector.
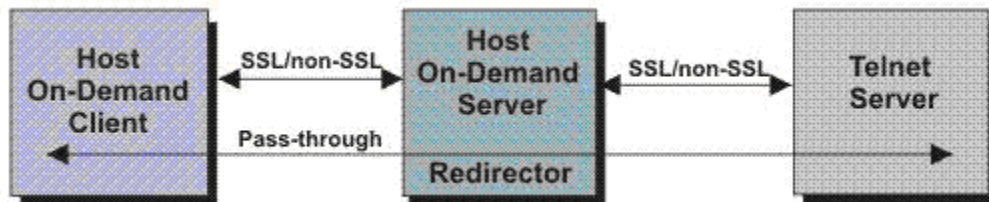
Secure connections are also possible between the client and the Host on Demand Server.

This is an IBM Host on demand (HOD) Redirector version 11.0.7 Performance publication.

The objective of this document is to provide end users with information on the scalability, responsiveness and throughput of HOD Redirector 11.0.7 under a given workload.

This document covers the Performance test results of HOD Redirector that is configured with a default HOD server JVM, a single port and SSL connection mode on AIX. The results are depicted in terms of the maximum number of concurrent users allowed by this arrangement along with the response time, throughput and CPU utilization.

2.0 GENERAL MEASUREMENT INFORMATION

2.1 Test Environment

The performance tests are conducted in our in-house controlled lab with default settings for HOD Server JVM heap and a single port (12173). Hence, the results obtained in other operating environments might vary significantly.

Performance will also vary by hardware, software, applications, user workload, networking environment, etc.

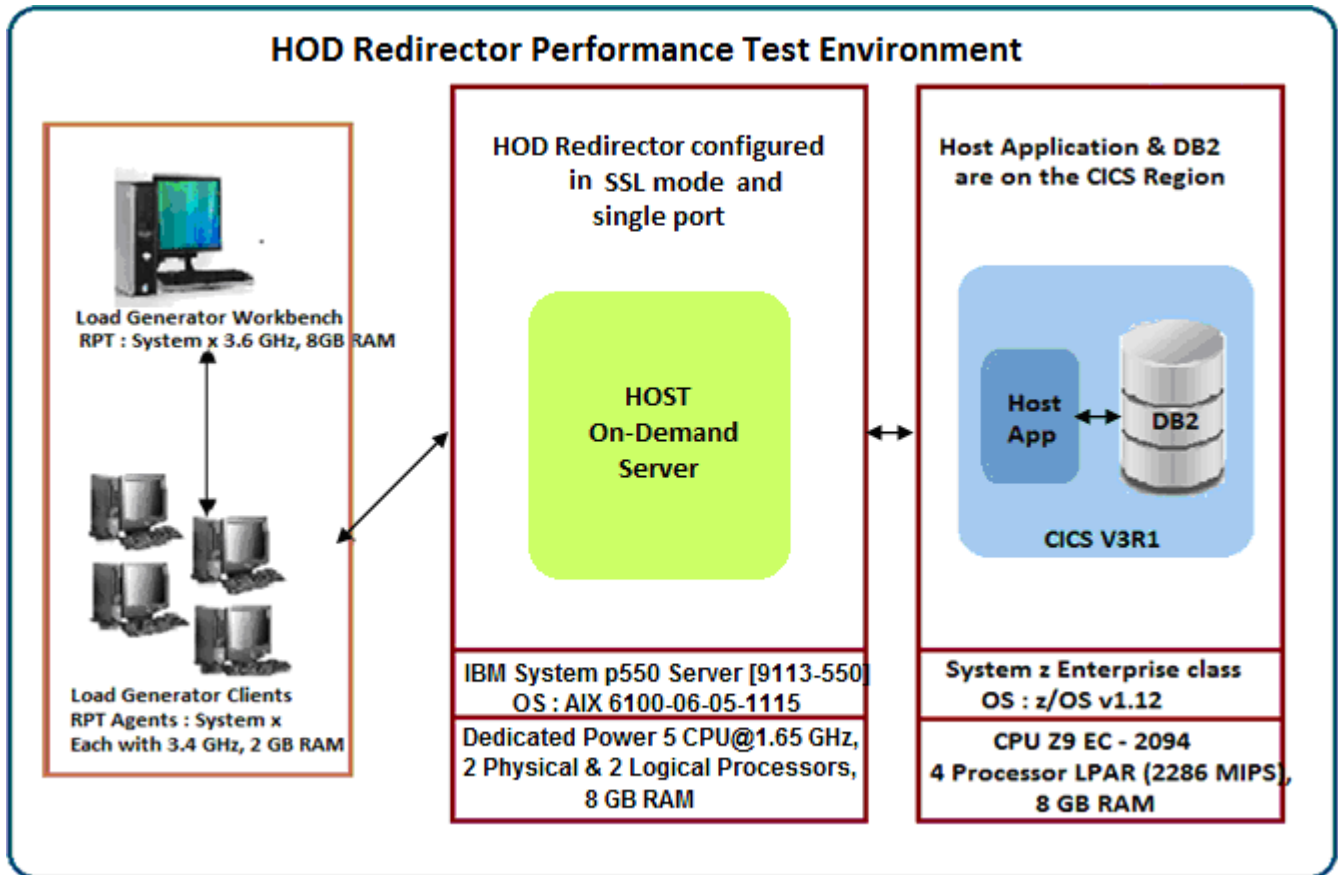The performance test environment consists of a HOD Redirector installed in AIX, a host application installed in the CICS region of a 3270 Host interacting with DB2, a load generator workbench and multiple load generator clients.

The Power System (system p) with AIX as the Operating system and running HOD Redirector, 3270 Host, load generator workbench and load generator clients are connected to a 1 GB Ethernet LAN as shown below:
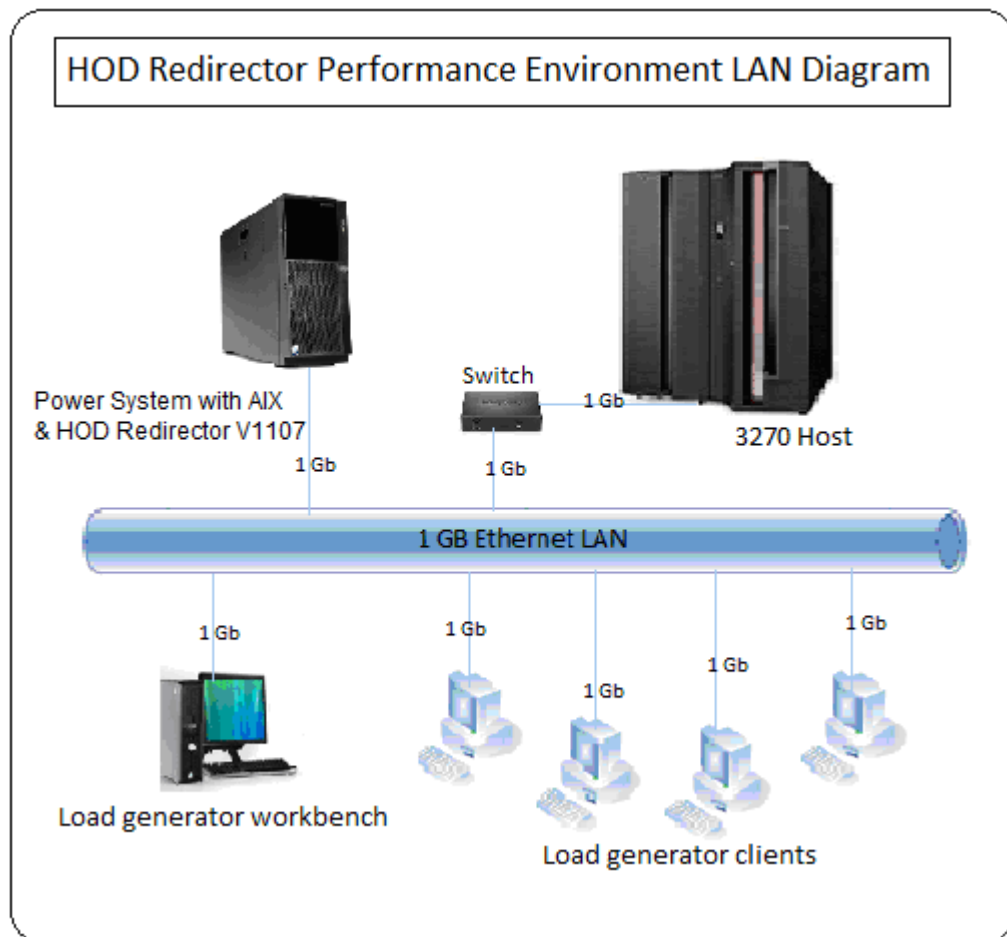
The load generator workbench sends test scripts and run commands to the load generator clients. The load generator clients create equal load on all the single port of the HOD redirector and drive the HOST application, which is running on a CICS transaction server in an LPAR in z/OS and needs access to a DB2 database.

This is depicted in the figure below:

HOD Redirector Performance Test Environment

Load Generator Workbench
RPT : System x 3.6 GHz, 8GB RAM

Load Generator Clients
RPT Agents : System x
Each with 3.4 GHz, 2 GB RAM

HOD Redirector configured in SSL mode and single port

HOST On-Demand Server

IBM System p550 Server [9113-550]
OS : AIX 6100-06-05-1115

Dedicated Power 5 CPU@1.65 GHz,
2 Physical & 2 Logical Processors,
8 GB RAM

Host Application & DB2 are on the CICS Region

Host App ↔ DB2

CICS V3R1

System z Enterprise class
OS : z/OS v1.12

CPU Z9 EC - 2094
4 Processor LPAR (2286 MIPS),
8 GB RAM

2.2 Hardware Configuration

The table lists the hardware used for the performance measurements in the lab:

Role	Model	Hardware Architecture	Number of Processors (Total Cores)	Processor Speed	Memory (GB)
System p	IBM System p550 Server [9113-550]	PowerPC_Power5	4	1.65 GHz	8
3270 Host	Mainframe	Z9 EC -2094	4	2286 MIPS	8
Load generator workbench	eServer 226 [8648PBE]	Intel® Xeon™	8	3 GHz	4
Load generator client 1	eServer x226-[8488Z1H]	Intel® Xeon™	4	3.2 GHz	4
Load generator client 2	eServer x226-[8488Z1H]	Intel® Xeon™	4	3.2 GHz	4
Load generator client 3	eServer x226-[8648PBE]	Intel® Xeon™	4	3.0 GHz	4
Load generator client 4	eServer x226-[8648PBE]	Intel® Xeon™	4	3.0 GHz	4

The System p used is a Power 5 machine with 4 physical processors & 4 Logical processors.

2.3 Software

The table lists the operating system and software used for performance measurements in the lab:

Role	Operating System	Software
System p	AIX 6100-06-05-1115	HOD Redirector
Host	z/OS V1.12	Host Application
Load generator workbench	Microsoft Windows Server 2003 Standard	Rational Performance Tester 8.2
Load generator clients	Microsoft Windows Server 2003 Standard	Rational Performance Tester 8.2 Agents

2.4   Workload Characterization

The 3270 Host application used for performance measurements is called as "Global Auto Mall" (GAM).
The Global Auto Mall Application has 3 components: Login, Process & Logoff and Spawns over 28 Host Screens

During benchmarking measurements, users logon to a host system application (execute the logon component); do work for a significant amount of time that is navigate through screens (execute the process component), and then logoff from the host application (execute the logoff component). The details of the actions performed are as below:

Host Screen 1 – 3 : **Login**
> Connects to System z and prompts for CICS Application
> Connects to CICS region and prompts for user credentials to login to GAM
> Prompt to enter the name of the GAM application

Host Screen 4 - 27 : **Process (GAM application interacts with DB2 to fetch the requested data)**
> Displays the Main Menu of the Global Auto Mall Application listing a set of cars
> Select one of the cars in the list say, Toyota / Chevrolet / Honda
> Displays the Variants of the selected car
> Select one of the variants say Toyota Camry / Chevrolet Silverado / Honda Accord
> The Camry models spawn over 10 Host Screens, Silverado over 2 and Accord over 6.

Host Screen 28 : **Logoff**
> Return to the Main menu of GAM and logoff from the application

2.5   Test Methodology

To simulate the user interactions described above and generate the desired user workload IBM Rational Performance Tester (RPT) was used. Each user executes the use case described above. The following steps are taken into consideration while simulating any specific user load (say 1000 users, 2000 users etc.):

- Each user is ramped up (added) in 1 seconds
- Each user starts execution as soon as it is ramped up
- Once the desired user population has been reached, a system might still experience a period of flux in reaction to the change in user population. This is managed by setting the settle time to 10 seconds which allows the system to re-establish its steady-state equilibrium so that it can accurately reflect the user population.
- After all the users are ramped up, all of them will execute the above Use Case for about 10 minutes before they are stopped gracefully

3.0   TEST RESULT

The table below lists the number of successful connections that can be established along with the various performance parameters (Avg Response Time [ms], Page Throughput, CPU Utilization) measured with respect to the User Load.

Type of Connection	No of Concurrent active Users	No of Successful Connections	Avg Response Time [ms]	Page Throughput [Terminal screens / sec]	CPU Utilization [% of system CPU time (Avg for Run)]
SSL	1000	1000	4.51	271.25	14.86
	2000	2000	8.41	489.23	20.49
	3000	3000	13.6	697.05	22.31
	4000	4000	33.3	893.93	23.4

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