

# Installation

LENA Support

Version 1.3.2.4

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# Chapter 1. Overview

! " # \$ LENA Server% &' ( ) \* # + , - . / ) O 1 2. LENA 3 4 5 ) 6 7 &' - . 1 8 9:  
; < = > ? @ \$ &' A B C D E F G 1 2.

## 1.1. ! " # \$

LENA\$ Web Server, WAS(Web Application Server)H Web Server3 Status% I J ( \$ Node Agent,  
Application Server- + , @K StatusLM% >? ( \$ AdvertiserH NOA- P >?@\$ QRNO <SJ  
Manager= STU2.

### 1.1.1. Server

LENA- # >?@\$ #V3 WX\$ Web Server, Application Server 2YZY [ 2. \ #V3 9<\$ ] ^H  
\_2.

- ¥ Web Server: ` 9A a b- c d Web Resource% >? 1 2. Application ServerY >? ( \$  
e 9#f g 3 Fronthi E j k ( l #, m n o p = Load Balancing 7 M q r s K(SSL)% >? ( \$  
h i E j k 1 2.
- ¥ Application Server: Java= t T U e 9 #f g % u k />? 1 2.

### 1.1.2. Agent, Advertiser

Node, Server- + , @K >K 7 v w x y ) 6 E z { ( \$ Agent s 2.

- ¥ Node Agent
  - | Web Server } ~ v w x y • s x % ∈ R ( • Manager- P >? 1 2.
- ¥ Advertiser
  - | Application Server } ~ v w x y • s x % ∈ R ( • Manager- P >? 1 2.

### 1.1.3. Manager

Manager\$ Node AgentH Advertiser% Q( • NodeH Server3 >K 7 v w x y ) 6 , E  
>? ( \$ Web Applications 2. . f o p = ] ^H \_ : ) 6 E >? 1 2.

Table 1. LENA Manager „ a ) 6

| %&        | ' (  |
|-----------|--|
| Dashboard | ¥ Server ...†<br>¥ Notification I J  |
| Server    | ¥ System (‡ O o Server ^ % o ) , Š / j L / < >   |
| Resource  | ¥ Reosource3 Œ • 7 , Š / j L / < ><br>Database / DataSource / Application<br>¥ Resource% ` 9 ( \$ Server Ž Š Œ • 7 , Š / j L / < > |

|             |   |
|-------------|---|
| %&          | ' (   |
| Diagnostics | ¥ Server- . 1 s• ...† v w x y ) 6   |
| Topology    | ¥ System; Server S T ...† €•  |
| Admin       | ¥ ` 9A 7 • 1 NO, ` 9A/• 1/' C B'<br>¥ ` 9A &' s" €•<br>¥ d s m g NO, ...† €• 7 " =• |

## 1.2. Mechanism

LENA\$ Manager% Q/ # Web Server/WAS % v w x y 7 QRNO( \$ ) 6E >? 1 2. s% - /  
Noded\$ --- = AgentY +, @\$• s% Node AgentdG 1 2. Node Agent\$ Manager3 ` 9A  
~™E 4Š> ] Node- +, U Web Server/WAS % >K( œ NodeY +, U Host/VM, Web Server 3  
v w x y L M% Manager= 4• 1 2.

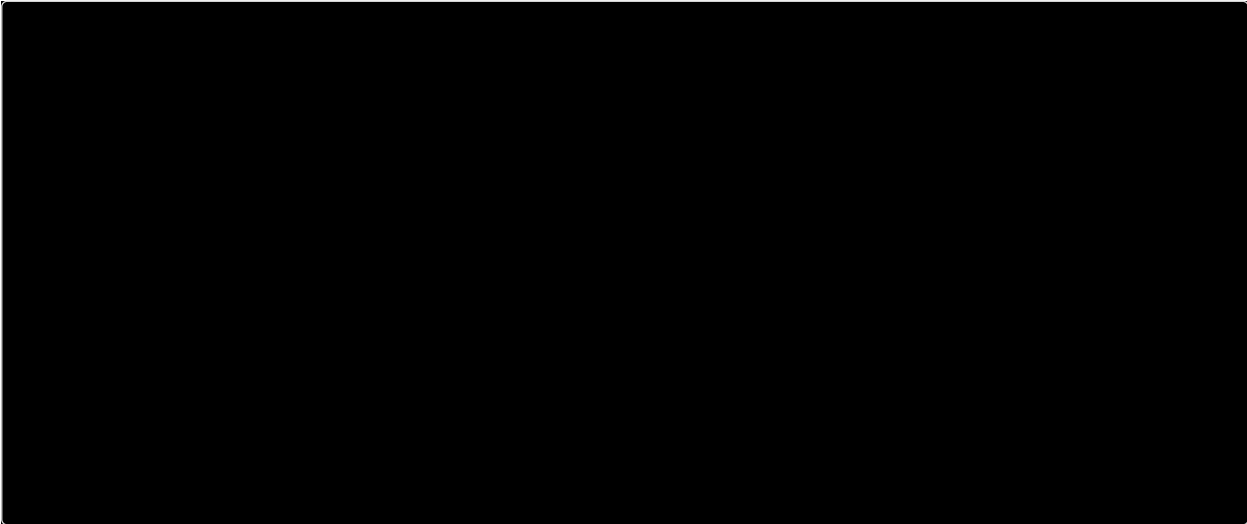


Figure 1. LENA Manager3 v w x y 7 QRNO3 t ž Ÿ

LENA Manager, Web Server, WAS j - < Manager3 ž t E - / ` 9@\$ Manager Repository, WAS3  
v w x y L M j €E - 1 AdvertiserY t ž ( • Manager% Q1 v w x y 7 QRNOY Y6( <Š  
1 2.

|                    |   |
|--------------------|---|
| %&                 | ' (   |
| Manager            | # V- £ ¤ @\$ + L ¥! NO 7 Server v w x y ) 6 >?  |
| Manager Repository | Manager &' E - 1 ¥! \$ `` Repository, \ W + L L M 7 DB L M%<br>¤ © ©                                  |
| Node Agent         | Web # V v w x y • s x € R 7 Manager- P • <sup>a</sup> , Manager= « x<br>j <sup>a</sup> 1 >K/+L ~™ u k |
| Application Server | Application Server Instance   |
| Web Server         | Web Server Instance   |
| Advertiser         | v w x y • s x € R 7 Manager- P • <sup>a</sup> (Application Server- QR)                                |

# Chapter 2. Installation Prerequisite

## 2.1. ) \* + # ! , %

### 2.1.1. Hardware Resource

¥ CPU

4op= Sž ( GA ( \$ Web Applications K- L<3 T6E aS( \$Z- š- [ 2. ) ! oJ  
LENA #fg Sž - @a1 CPU\$ 2 Core s} E • G12.

¥ Memory

Memory- . /#\$ ] ^ f% FÆ12. Web Server% >ı 1 v- Module: JVM ) ° p=  
ž t ( ±= Heap Memory% ` 912. LENA- # \$ ) ! Heap Memory ² E ³ O +L/ ´ μpœ,  
+, ¶- /{ ² p= +, @. @a- cd j Ls Y6( 2. qLoJ &' E -/ ( . 3 ı Oo  
#V- +, 1 v- v° 3 Heap Memory +L ² 3 Rs ı O #V3 »• ' vO 9¼M2 ½Z  
¾<Š ğ 312.

LENA Manager 7 \ Server +, - . 1 ÄÄ aS` Ä: 2ÄÄ \_2.

| ! -                | JVM       | Disk Space | . \$ Memory | / O Memory |
|--------------------|-----------|------------|-------------|------------|
| Manager            | JDK 1.8 + | Ä 300 MB   | 512 MB      | 1 GB       |
| Node Agent         | JDK 1.8 + | -          | 64 MB       | 256 MB     |
| Application Server | JDK 1.8 + | Ä 100 MB   | 512 MB      | 2 GB       |
| Web Server         | JDK 1.8 + | Ä 50 MB    | 512 MB      | -          |

\ Server +, ¶ ) ! Memory ) Æp= +, @œ, Memory +L: ÄÄ Memory s} p= +L² E  
ÇÈ ( • o9ı j [ 2.

### 2.1.2. 1 2 3 4

¥ Linux

Redhat (RHEL, CentOS) 6.5 s} / Ubuntu 12.04 s} E ZÉ ( œ Y¨ • G( \$ &' 5>s2.  
ı ° oJ x86 ] ÊËÌ 3 Í T- Î <Š . 9¼ QR#V STM2\$ §9¼ 2j 3 #V- Ĩ Đ  
+, ( \$ ÑE • ¨ 12.

!

) ! op= LENA ModuleE uk¶Ê) -1 g½ÒÓ% >?12.  
ÔÅ OS Service= , Šs @ai ¶ #Vz{ AY OS ÕË- Î P Öx +L/Ø12.

### 2.1.3. 5 6

LENA% +, ( ) 4 LENA +, 7 ) ž- s91 ÛLs @a( 2. oR1 sı Y Ú2ı Mq } Root /  
Administrator ÛL: • G@Z ¾pœ s% Q/ LENA% uk¶Û j Úpw ; <3 ÛLE ³ O  
ÛT( <Š 12.

||

X86 ] ÊËÌ - # • G@\$ Ý\$ ] wZÔ, ÔÅ 1 ı O #V- # = 2P 2j 3 " B  
¶gå s &' @G \ ¶gå ; = z{ &' AY Sİ @œ ¶gå á xâ Q>% -/  
ÛLE Ĩ O( • ` 912G YL( A. sã Èä &' A ÛL ; (" B ¶gå ; )=  
Node% ST/+, ( • &' /Ø ( œ LENA Manager ä1 ¶gå ; = ST( \$ ÑE  
• G12.

## 2.1.4. 789:

LENA +, % æk ( ) - \* # s 4 —Ü- # ÜT1 ÛLs s 9 Y61 +, ç è é O % Æ f ( • Ø 1 2.  
] ^ f \$ LENA- # > q ( \$ ç è é O S T s æ ` 9 A ; = L ê - Î \$ ç è é O S T E s 9 ( I U 2.

Table 2. Directory Requirement

| ! -                    | Directory      | ; <                   |
|------------------------|----------------|-----------------------|
| LENA WAS Node(Binary)  | /engn001/lena  |                       |
| LENA WEB Node(Binary)  | /engn001/lenaw |                       |
| Web Server, WAS Log    | /logs001       | log È = Ì O ® a ¶ + L |
| Web Application Source | /sorc001       |                       |

G- i ` Ã: log ¥ | E Ì O i Ñ J Z • « s 2. log \$ ; < Ì O + L ( Z ¾ p I LENA Node Y  
+, @\$ È = ( - - ) ! Ü T U 2. log I J E è ì P ( I # < Disk 9 ¼ NO % í ( P ( ) - / # \$  
log ç è é O 3 Ì O % • `` 1 2.

Y 6 ( 2 I ; < j `` disk î Ì E Node, log, source ç è é O- Mount ( • OS System ' h Ä ð O ( \$  
Ñ E • `` 1 2.

## 2.1.5. JVM

JDK 3 È ä LENA +, æk ( ) 4 ; < Binary ñ ~ = ò: OS- # > ? ( \$ Package +, NOA % Q /  
+, Y @ K [ K Ø 1 2.

| LENA<br>=> | EN(Engine No) | JDK=>(LTS)                             | JAVA EE<br>Spec | Servlet<br>Spec |
|------------|---------------|--|-----------------|-----------------|
| 1.3.2.X    | 8 (Default)   | JDK 8 (1.8.x+), 11                     | 7               | 3.1             |
| 1.3.2.X    | 7             | JDK 6 (1.6.x+), 7 (1.7.x+), 8 (1.8.x+) | 6               | 3.0             |
| 1.3.2.X    | 9             | JDK 8 (1.8.x+), 11, 17                 | 8               | 4.0             |
| 1.3.2.X    | 10            | JDK 11, 17                             | 10<br>(Servlet) | 6.0             |
| 1.3.1.X    | N/A           | JDK 8 (1.8.x+), JDK 11                 | 7               | -               |
| 1.3.0.X    | N/A           | JDK 8 (1.8.x+), JDK 11                 | 7               | -               |

!

OracleJDK 3 È ä 8u202 V 4 ó Z Ô ß ô = s 9 i j [ 2.

## 2.1.6. Network

] ^ 2 s K ^ õ: LENA 3 \ Module á Ó ^ ö 3 ÷ ø E • ù ú < f s 2. LENA Management N Û  
È = H Web Service N Û È = Y } ü ý f ... @ K [ 2.

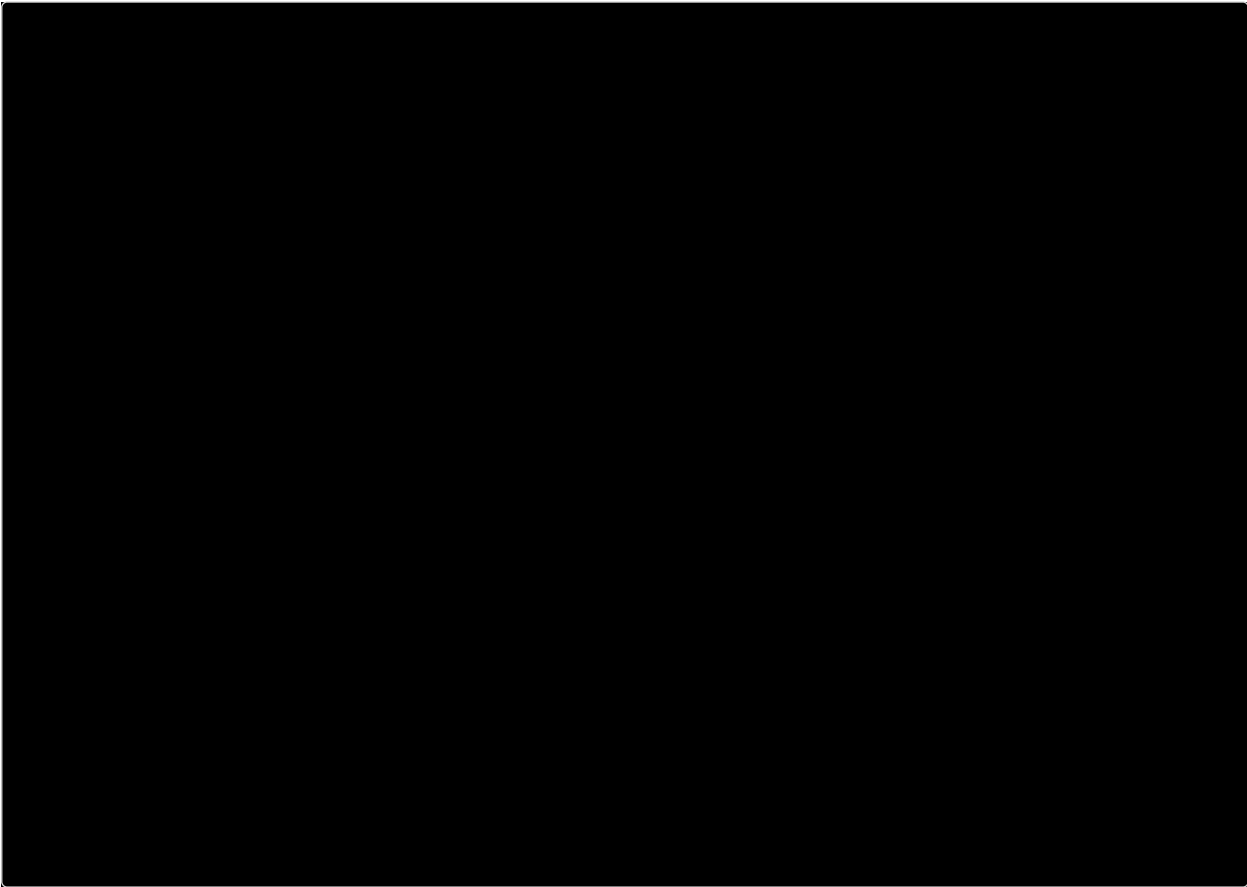


Figure 2. LENA Network Traffic

– 2sK^ õ- f...U LENA v° á Ó^ö È=H` 9 Port\$ ] ^ fH\_2. ~ ¶U Port þÿ\$ ` 4 L3U ) ! ² sœ \ Module +, ¶ ; <= ZLi j [ 2. ] ^ f% FG( • Port% mL 1 ! , ` 4- ÿ" # E Open / ´ ] Ø 1 2.

!

LENA- # ` 9( \$ Port\$ Mq a\$ } 1025s} 3 Port% s912. —, #f g >? ¶ 80 Port , 3 Well-known Port% s9/Ø 1 2I « Š- # >?@\$ 80αÖ s9 Ys • % FG1 2.

Table 3. LENA Firewall Open Rule

| Src            | Dest           | Protocol | Port  | ; <                |
|----------------|----------------|----------|-------|--------------------|
| &' A           | LENA Manager   | TCP      | 7700  | Manager Web UI × % |
| LENA Manager   | WEB Node Agent | TCP      | 16900 | WEB Node > K       |
|                | WAS Node Agent | TCP      | 16800 | WAS Node > K       |
| WEB Node Agent | LENA Manager   | UDP      | 16100 | vwxy LM • a        |
| WAS Node Agent |                |          |       |                    |
| WAS Advertiser |                |          |       |                    |

| Src        | Dest       | Protocol | Port | ; <   |
|------------|------------|----------|------|---|
| Web Server | Web Server | HTTP     | 8000 | WEB # f g x %                                   |
|            |            | HTTPS    | 8363 | WEB # f g Mq(SSL) x %<br>(HTTP + 363 / j L Y 6) |
| &' A       | WAS        | HTTP     | 8080 | WAS # f g x %                                   |
| Web Server |            | AJP      | 8009 | Web Server-WAS & Û<br>(HTTP - 71 / j L Y 6)     |
| WAS        | DB         | TCP      | 3306 | WAS JDBC x %                                    |

II

LENA\$ Web Server / WAS + , ¶ HTTP Port% Z L ( • + , ( < Š ( G [ 2. s  
HTTP Port% ) Æ p = HTTPS ¤ Ó H \_ : Server ž t E – 1 2 P Port% A ž Û Đ ( •  
+ , ( \$ • ^ ' ¶ Y – f - # s ( ) 5 = f ¶ U ¤ Ó s 2. c d # , Web Server,  
WAS% 2 j + , ( \$ Ä L - # s ³ ` 9 U 2 P Port H 3 \* + E Ÿ Z ( ) – / # 1 Ä  
103 AO\$ Web Server· WAS ; = ž | ( P , 1003 AO\$ Ç È ( • + , ( \$ Ñ E  
• ` 1 2.

Table 4. IPY \_ : ¶ f – Web Server, WAS + , ¶ HTTP Port + L ' ¶

| S Ĩ | Server ~ | HTTP Port | f G                        |
|-----|----------|-----------|----------------------------|
| WAS | ee_01    | 8080      | -                          |
|     | ee_02    | 8180      | ee_01 3 HTTP Port ² + 100  |
| Web | web_01   | 7180      | -                          |
|     | web_02   | 7280      | web_01 3 HTTP Port ² + 100 |

å 1 Dynamic Port Range% 4 5 Port , – = ` 9 ( Z - Ñ E • G 1 2. LENA ) ž -  
® a 1 Port% OS 3 2 P Service Y Source Port = . ¿ ( \$ | s / Ü i Y 6 T s [ 2.



# Chapter 3. Installation

## 3.1. LENA ' ?

LENA +, ¥| E . } #V3 ÆfU çèéO- " =• 1 2. +, ¥| E Q/ LENA Manager% +, ( GA ( \$ Server- LENA Manager% +, ( G Web Server% +, i Server- Web Server Node%, WAS% +, i Server- WAS Node% +, 1 2.

!

LENA +, % æk ( ) - \* # JVM E FÆ( • JDK% ³ O +, ( <Š 1 2.

Node3 +, O Web ServerH WAS3 +, \$ LENA Manager3 Web UI% Q/ # +, 1 2. LENA +, ¥| : >1 Sİ Ä 9<- cd 2ÄÄ \_s Sİ U2.

Table 5. LENA +, ¥| Sİ

| ' ? @A                                       | ; <                    |
|--|------------------------|
| lena-standard-linux_na_x86_64-2.0.0.0.tar.gz | LENA Manager, WAS +, 9 |
| lena-web-linux_na_x86_64-2.0.0.0.tar.gz      | Web Server +, 9        |

### 3.1.1. LENA Manager ' ? /BC

LENA +, 2ÊZ\$ 34¥| ñ p=, +, i #V- " =• O- 34E />( • ` 91 2. LENA Manager\$ WAS Node +, ¥| - æ©@K [ pæ +, i Ê=( ' :/engn001/lena)- +, ¥| E " =• O 34E 52.

#

LENA Manager\$ WAS Node +, ¥| - æ©@K [ 2.

' ? DE F ' ? @A GEHI J

```
Ê[l ena]# cd /engn001/l ena
Ê[l ena]# ll
Ê-rw-rw-r-- 1 l ena l ena l ena-standard-linux_na_x86_64-2.0.0.0. tar. gz
```

!

34 /> ¶ +, ¥| 3 l ` A «İ E >ı 1 · 6Z søp= çèéOY ÜT@\$• s çèéO ~ E 2.0 p= á 7( P ÇË( • ` 91 2.

' ? @A KL M4 / 789: ( ND

```
Ê[l ena]# tar -xvzf l ena-standard-linux_na_x86_64-2.0.0.0. tar. gz
Ê[l ena]# mv l ena-standard-linux_na_x86_64-2.0.0.0 2.0
Ê[l ena]# ll
Êdrwxr-xr-x 12 l ena l ena 2.0
Ê-rw-rw-r-- 1 l ena l ena l ena-standard-linux_na_x86_64-2.0.0.0. tar. gz
```

install.sh(' :/engn001/l ena/2.0/bin/install.sh) ¥| E s 9( • +, ( æ 2ÄÄ \_: ~ ™K% ` 9( • +, i j [ 2.

LENA Manager ' ?

```
[lena]# cd /engn001/l ena/2.0/bi n
[l ena]# ./install.sh create l ena-manager
*****
*   LENA Server Install !       *
*****

+-----+
|-----|
| 1. SERVICE_PORT is the port number used by Manager.
|    ex : 7700
| 2. MONITORING_PORT is the port number used by Manager for monitoring.
|    ex : 16100
| 3. RUN_USER is user running LENA Manager.
|    ex : l ena, wasadm
+-----+
|-----|

Input SERVICE_PORT for execution. (q: quit)
Default value is '7700'
7700
```

LENA Manager +, Y 8ô@l install.sh E uk 1 çèéO- LENA Manager H NûU Script ¥| s ÛTU2.

Table 6. LENA Manager NO9 Script ¥|

| Script @A(       | ' (                            |
|------------------|--------------------------------|
| start-manager.sh | LENA Manager % ¶  t 1 2.       |
| ps-manager.sh    | LENA ManagerY uk 9J Z I J 1 2. |
| stop-manager.sh  | LENA Manager % 9Z 1 2.         |

start-manager.sh E uk ( • LENA Manager% ¶| t 1 2.

```
[l ena]# ./start-manager.sh
-----
Ê          LENA Manager
-----

Usi ng LENA_HOME      : /engn001/l ena/j adeu3/2.0
Usi ng JRE_HOME       : /engn001/j ava/j dk1.8.0_202
Usi ng SERVER_PID     : /engn001/l ena/j adeu3/2.0/modul es/l ena-manager/l ena-
manager_sol manager. pi d
Usi ng SERVER_HOME    : /engn001/l ena/j adeu3/2.0/modul es/l ena-manager
Usi ng SERVER_ID      : l ena-manager
Usi ng INSTANCE_NAME  : l ena-manager_sol manager
LENA started.
```

LENA ManagerY L } op = uk @l /{ # V3 Service Port= Manager- x%i j [ 2.

[http://Server\\_IP:7700](http://Server_IP:7700)

] ^3 : ) x% ÛL/f ; þÿ = x%( I : ) " I E I J i j [ 2.

O/ PQ 56/; RST

admin / ladmin1234

### 3.1.2. Node ' ? (Command Line)

Node3 +, \$ LENA +, 2ÊZ3 34E <\$ ÑÄ \_2. WAS, Web Server% +, i #V- \ +, 2ÊZ% Æf 1 Ê =(' : /engn001/lena å \$ /engn001/lenaw)- " =• O 34E />1 2.  
Node% +, ( I ] ^H \_s Node Agent% uk, 9Z, } ~I J E ( ) - 1 scriptY =>1 2.

Table 7. Node Agent NO Script

| script DE   | script (       | ; <                      |
|---|----------------|--------------------------|
| Node +, Ê = ( - 'bin'<br>( ' : /engn001/lena/2.0/bin) | start-agent.sh | Node Agent uk            |
|   | ps-agent.sh    | Node Agent ? = üg<br>I J |
|   | stop-agent.sh  | Node Agent 9Z            |

WAS Node ' ?

WAS Node3 +, ¶ G- i j [ \$ ` Â: 2ÃÄ \_2.

1. LENA ManagerH WAS Node% \_: Server- +,
2. LENA ManagerH WAS Node% 2P Server- +, (LENA Manager @Ò +, )

1p3 Èä LENA Manager +, /uk - # LENA Manager% +, ( ) - / WAS Node +, 2ÊZ3 34E ABp± = s³ WAS NodeY +, @K [ \$ } ~s2.

2p3 Èä WAS Node% +, i Server3 Æf 1 Ê =(' : /engn001/lena)- LENA WAS +, 2ÊZ% " =• O 2ÃÄ \_s 34E AK +, 1 2.

+ , Ê = 7 +, ¥| " =• I J

```
Ê[l ena]# cd /engn001/l ena
Ê[l ena]# ll
Ê-rw-rw-r-- 1 l ena l ena l ena-standard-l inux_na_x86_64-2.0.0.0. tar. gz
```

!

34 /> ¶ +, ¥| 3 I ` A «İ E >ı 1 · 6Z søp = çèéOY ÛT@\$•  
s çèéO ~ E 2.0 p = á 7( P ÇÈ( • ` 912.

+ , ¥| 34 /> /çèéO ~ ÇÈ

```
Ê[l ena]# tar -xvzf l ena-standard-l inux_na_x86_64-2.0.0.0. tar. gz
Ê[l ena]# mv l ena-standard-l inux_na_x86_64-2.0.0.0 2.0
Ê[l ena]# ll
Êdrwxr-xr-x 12 l ena l ena 2.0
Ê-rw-rw-r-- 1 l ena l ena l ena-standard-l inux_na_x86_64-2.0.0.0. tar. gz
```

Node% + , C2I start-agent.sh= Node Agent% uk 1 2.

Node Agent uk

```
[lena]# cd /engn001/l ena/2.0/bin
[l ena]# ./start-agent.sh
Input JAVA_HOME path for LENA. ( q: quit )
JAVA_HOME PATH :
/engn001/j ava/j dk1.8.0_202 !
Input Agent port for LENA Agent. ( q: quit )
Agent port (Default : 16800):
16800 "
Input Agent user for LENA Agent. ( q: quit )
Agent user (Default : l ena):
l ena #

-----
Ê          LENA Agent
-----
Usi ng LENA_HOME      : /engn001/l ena/2.0
Usi ng JAVA_HOME      : /engn001/j ava/j dk1.8.0_202/j re
Usi ng CONF_FILE      : /engn001/l ena/2.0/conf/agent.conf
Usi ng LOG_HOME       : /engn001/l ena/2.0/logs/l ena-agent
Usi ng RUN_USER       : l ena
Usi ng PORT           : 16800
Usi ng UUID           : 98449860-0a9a-323b-9766-98c4292000df
LENA Agent is started.
```

Node Agent uk ¶ D" > \$ ÃŽ: 2ÃÄ \_2.

- ¬ JAVA HOME (jdk) Ê = D"
- ¬ Node AgentY ` 9i Port D"
- ¬ Node Agent uk OS ÛL D"

Web Server Node ' ?

Web Server% + , i Server- LENA Web Server + , 9 2ÊZ% " =• O 34E AK + , 1 2.

Ê = / ¥ | I J

```
Ê[l enaw]# cd /engn001/l enaw
Ê[l enaw]# ll
Ê-rw-rw-r-- 1 l ena l ena l ena-web-l inux_na_x86_64-2.0.0.0.tar.gz
```

+, ¥! 34 /> /çèéO ~ ÇÈ

```
Ê[lena]# tar -xvzf lena-web-linux_na_x86_64-2.0.0.tar.gz
Ê[lena]# mv lena-web-linux_na_x86_64-2.0.0 2.0
Ê[lena]# ll
Êdrwxr-xr-x 12 lena lena 2.0
Ê-rw-rw-r-- 1 lena lena lena-web-linux_na_x86_64-2.0.0.0.tar.gz
```

#

34 /> ¶ +, ¥! 3 I " A «İ E >ı 1 · 6Z s ø p = çèéOY ÛT@\$•  
s çèéO ~ E 2.0 p = á 7( P ÇÈ( • ` 912.

Node% +, 1 O start-agent.sh= Node Agent% u k 1 2.

Node Agent u k

```
[lena]# cd /engn001/lena/2.0/bin
[lena]# ./start-agent.sh
Input JAVA_HOME path for LENA. ( q: quit )
JAVA_HOME PATH :
/engn001/java/jdk1.8.0_202 !
Input Agent port for LENA Agent. ( q: quit )
Agent port (Default : 16800):
16800 "
Input Agent user for LENA Agent. ( q: quit )
Agent user (Default : lena):
lena #

-----
Ê          LENA Agent
-----

Using LENA_HOME      : /engn001/lena/2.0
Using JAVA_HOME      : /engn001/java/jdk1.8.0_202/jre
Using CONF_FILE      : /engn001/lena/2.0/conf/agent.conf
Using LOG_HOME       : /engn001/lena/2.0/logs/lena-agent
Using RUN_USER       : lena
Using PORT           : 16800
Using UUID           : 98449860-0a9a-323b-9766-98c4292000df
LENA Agent is started.
```

Node Agent u k ¶ D" > \$ ÂŽ: 2ÄÄ \_2.

- ¬ JAVA HOME (jdk) È = D"
- ¬ Node AgentY ` 9i Port D"
- ¬ Node Agent u k OS ÛL D"

LENA ManagerU NodeV WX(Y Z)

WAS NodeH Web Server Node% +, ( G Agent% ) ž ( I LENA Manager% Q/ Node% , Ši j  
[ 2.

LENA Manager3 } — 'SERVER' ' C% mn( l Node List% l J i j [ 2.  
 Node , ŠE – / 'Register' VEE F) ( l ] ^H \_s Node% , Š( ) – 1 Empty RowY GY@œ  
 \ D" ÅŽE , Š1 2.

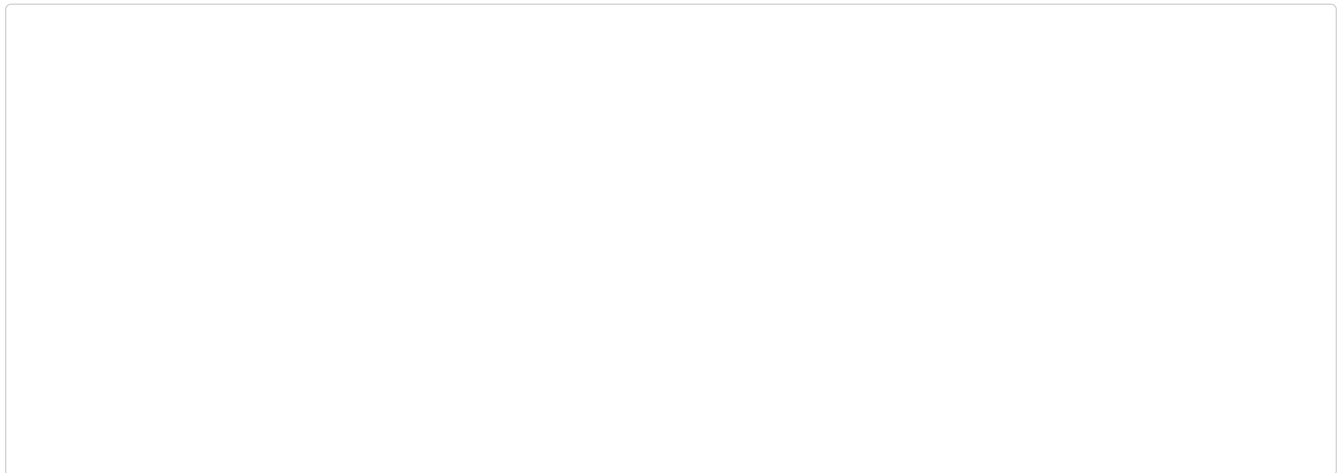


Figure 3. SERVER ' C : ) " l

Node , Š ¶ D" i ÅŽ: 2ÄÄ \_2.

1. Node Name: , Ši Node3 ~ H
2. Node Type: Application / Web 9- mn
3. Node IP: NodeY +, U Server3 IP Adress
4. Node Port: Node +, ¶ D" 1 Node Port

Manager Address ÅŽ 3 Èä LENA ManagerY +, U Server3 IPY Až D" @± = ; < D" i  
 @a \$ Ú2.

D" ÅŽE v l D" 1 ! 'Save' VEp = Node , ŠE 8ô( œ L} Ì O ¶ ] ^H \_: " l E l J i  
 j [ 2.

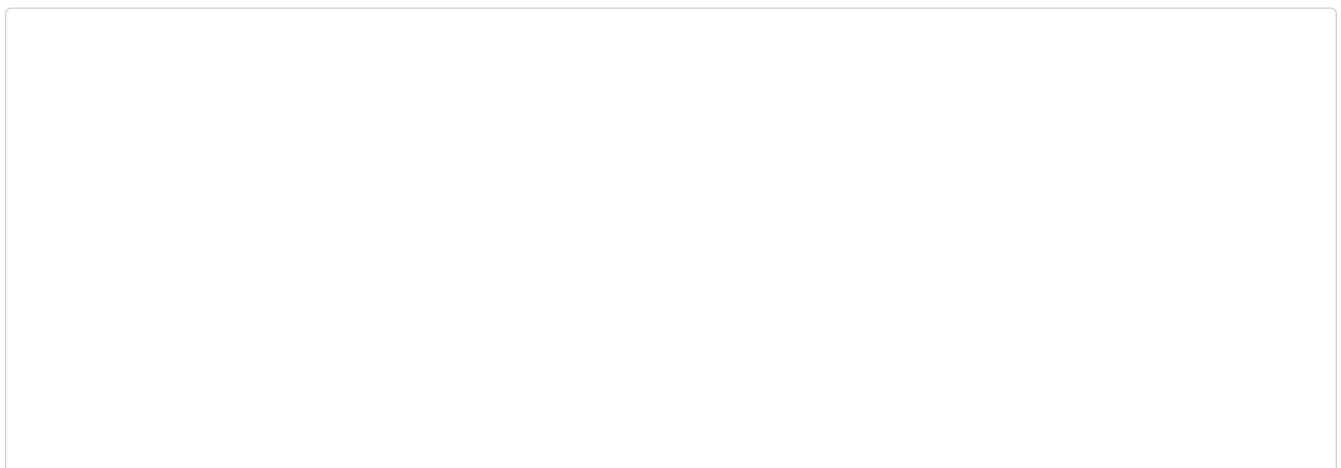


Figure 4. Node L } , Š ' ¶ " l

### 3.1.3. Node [ \ ' ? (LENA Manager Web UI)

Node3 +, \$ Node +, (Command Line) - # æk 1 ŸJ j - < LENA Manager% Q/ É ðp =  
 +, i j < [ 2. s% – / # \$ LENA (Manager)% +, 1 Server3 Í L ç è é O q- LENA  
 +, ¥ l (WAS, Web Server)% " = • / l K Ø 1 2. +, 2 Ê Z% " = • / l K Ø ( \$ È = 3 ' ¶ l \$  
 2ÄÄ \_2.

Table 8. Node É ð +, % – 1 +, ¥ l " = • È = ( ' ¶ l)

| LENA ' ? DE                   | LENA ' ? ] ^ _ GE H DE                       |
|-------------------------------|--|
| /engn001/lena/2.0 (LENA_HOME) | [LENA_HOME]/repository/install-files/default |

/ { È = - \* # ` 91 WAS, Web Server + , ¥ | E " = • 1 2.

É Ò + , % - 1 + , 2 Ê Z I J

```
[lena]# cd /engn001/lena/2.010/repository/install-files/default
[lenna]# ll
-rw-rw-r--. 1 lena lena lena-standard-linux_na_x86_64-2.0.0.0.tar.gz
-rw-rw-r--. 1 lena lena lena-web-linux_na_x86_64-2.0.0.0.tar.gz
```

/ { È = - + , 2 Ê Z % " = • C 2 I LENA Manager 3 'SERVER' ' C % mn ( G ( — 3 'Install'  
V E E F ) 1 2.

Figure 5. WAS Node É Ò + , ' ¶

Node É Ò + , ¶ D " / Ø ( \$ Å Ž : 2 Ä Ä \_ 2.

1. Node Type: Application / Web 9 - mn
2. Node Name: É Ò Server - + , i Node 3 ~ H
3. Node Address: Node % + , i É Ò Server 3 IP Adress
4. Node Port: É Ò Server - # Node Y ` 9 i Port
5. User: É Ò Server 3 OS Û L
6. Password: É Ò Server 3 OS Û L 3 f ; p ÿ
7. SSH Port: É Ò Server 3 SSH Port
8. LENA Home: É Ò Server - Node % + , i È = ( D " 1 È = 3 « v È = - . 1 K ) • 1 ® a ©.)
9. Java Home: É Ò Server - + , @ K [ \$ JAVA Home È =

É Ò + , - # D " ( \$ ² E é . = , LENA Manager \$ \* # ³ O Æ f / L + , 2 Ê Z ¥ | E É Ò  
Server = 4 • ( G Node % + , ( G , + , 1 Node 3 Agent % Å Ž p = u k ( \$ Ñ p = É Ò + , \$  
8 Ô U 2 . s M 1 æ k } † : Pop up NE Q / I J i j [ 2.



Figure 6. WAS Node Configuration

WAS Node Configuration



Figure 7. Node Configuration



Node3 Configuration, % - / # \$ LENA ManagerY +, U ServerH Configuration, i Server  
á 3 SSH Port Y" #s Open @K[ KØ 1 2.

3.1.4. WAS Configuration

WAS Node% Configuration, , , ŠóZ 8ôC2I s > LENA Manager Web UI% Q/ WAS % +, i j [ 2.  
LENA Manager } —3 'SERVER' ' C% mn 1 ! OP- # WAS % +, i WAS Node% mn( I  
WAS List% I J i j [ 2. s " I - # 'Install' VEE F) 1 2.

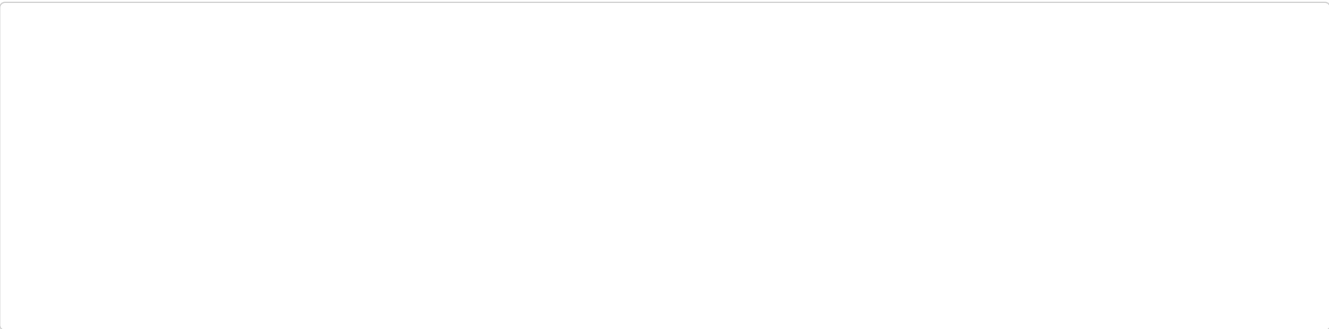


Figure 8. WAS List



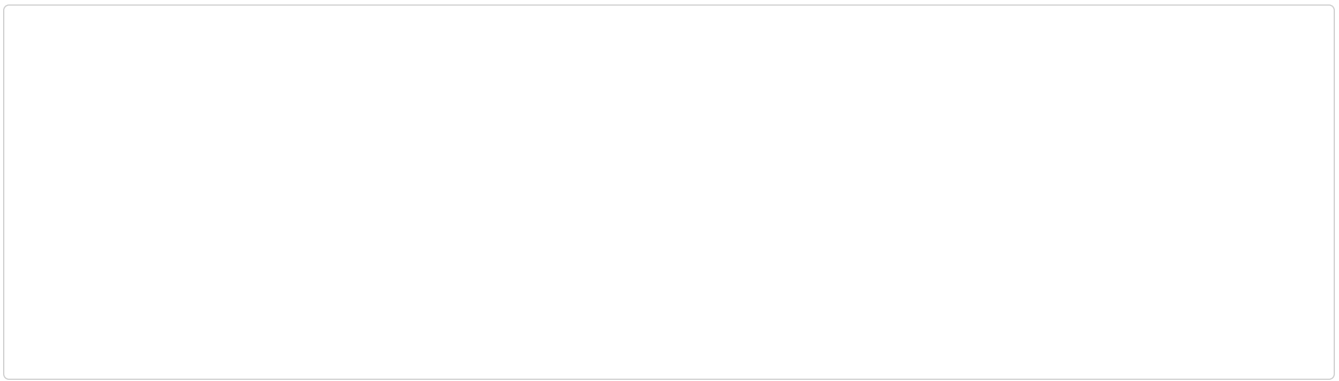


Figure 9. WAS +, LM D" Popup Ä D" ² ' ¶

'Install' VEE F) ( I WAS% +, ( ) - 1 LM% D" ( \$ Popup Ns Q" @œ \ D" ÂŽ: 2ÄÄ \_2.

1. Server Type: Standard
2. Node: WAS Y +, ¹ Node(j L RY)
3. Server ID: LENA Manager Y WAS% ; ( ) - 1 ~ H
4. Service Port: WAS Y +, ¹ S ) Æs @\$ HTTP Port% 3³
5. Run User: WAS 3 ) Ž ¶ ` 9i OS ÛL(j L RY)
6. Install Root Path: WAS Y +, ¹ È = (j L RY)
7. Log Home: WAS Log3 È =
  - a. default: [Install Root Path]/logs
  - b. cutom: ` 9AY T 3 = È = Z L
8. JVM Route: Web ServerH &Ž ¶ Web Server Y WAS% ; ( ) - 1 ²
  - a. auto: LENA- # AŽ ÛT
  - b. manual: ` 9AY T 3 = Z L



WAS \$ ) Ž ¶ HTTP, HTTPS, AJP , 2U1 Port% ` 9( \$• LENA - # \$ WAS +, ¶ ` 9A í 3% - / HTTP Port ÔE D" > G s% ) Æp= 2P Port ² E AŽ ÛÐ( • +, 1 2.

WAS +, LM% vI D" 1 ! 'Save' VEE F) ( I WAS Y +, @œ WAS List - # +, 1 WAS % I J i j [ 2.

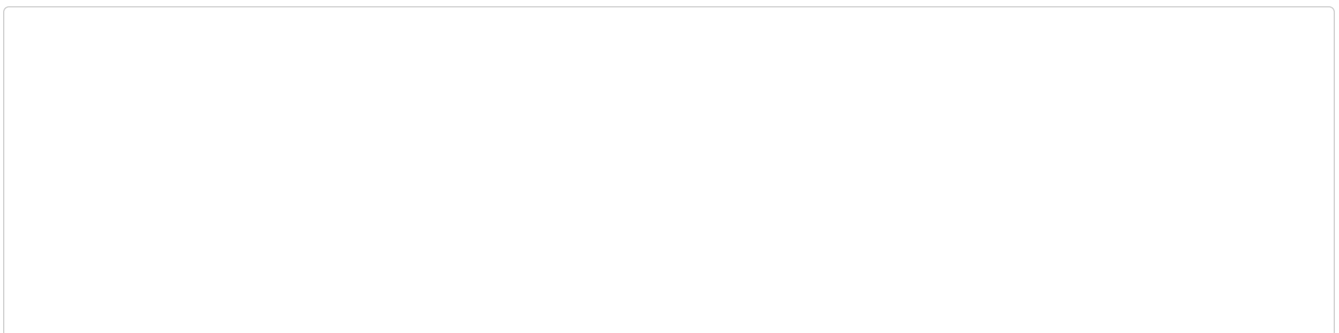


Figure 10. WAS L} +, O WAS List

9Z@K [ \$ WAS % ) Ž ( - I WAS List ä P3 'Start' VEE F) 1 2. å 1 ) Ž @K[ \$ WAS % 9Z( - I \_: -, - 'Stop' VE p= ÝV± = / { VEE F) 1 2.

WAS ) Ž ¶ - \$ WAS ) Ž Log(Application s £ ¢@K [ 2I Application ) Ž Log < ©W)Y Popup Np= Q" U2.



Figure 11. WAS3 ) ž Ä Log

3.1.5. Web Server ' ? /BC

WAS +, H ž | 1 Ÿ p =, LENA Manager Web UI% Q/ Web Server% +, i Web Server Node% mn 1 ! Web Server% +, i j [ 2.



Figure 12. Web Server List I J



Figure 13. Web Server +, LM D" Popup Ä D" ² ' ¶

'Install' VEE F ) ( I Web Server% +, ( ) – 1 LM% D" ( \$ Popup Ns Q" @œ \ D" ÄŽ: 2ÄÄ \_2.

- 1. Server Type: Web Server (GL)
- 2. Node: Web Server Y +, ¹ Node (j L RY)
- 3. Server ID: LENA Manager Y Web Server % ; ( ) – 1 ~ H

4. Service Port: Web Server Y ` 9i HTTP Port
5. Run User: Web Server ) ž ¶ ` 9i OS ÛL(j LRY)
6. Web Server Engine Path: Web Server +, ¶ ` 9i Engine Ě = (j LRY)
7. Install Root Path: Web Server Y +, 1 Ě = (j LRY)
8. Log Home: Web Server Log Ě =
  - a. default: [Install Root Path]/logs
  - b. custom: ` 9AY T 3 = Ě = Z L



Web Server \$ ) ž ¶ HTTP, HTTPS , 2U1 Port% ` 9( \$• LENA - # \$ Web Server +, ¶ ` 9A í 3% - / HTTP Port ÔE D" > G s% ) Æp = 2P Port ² E Až ÛĐ( • +, 1 2.

Web Server +, LM% vI D" 1 ! 'Save' VEE F) ( I Web ServerY +, @œ Web Server List - # I J i j [ 2.

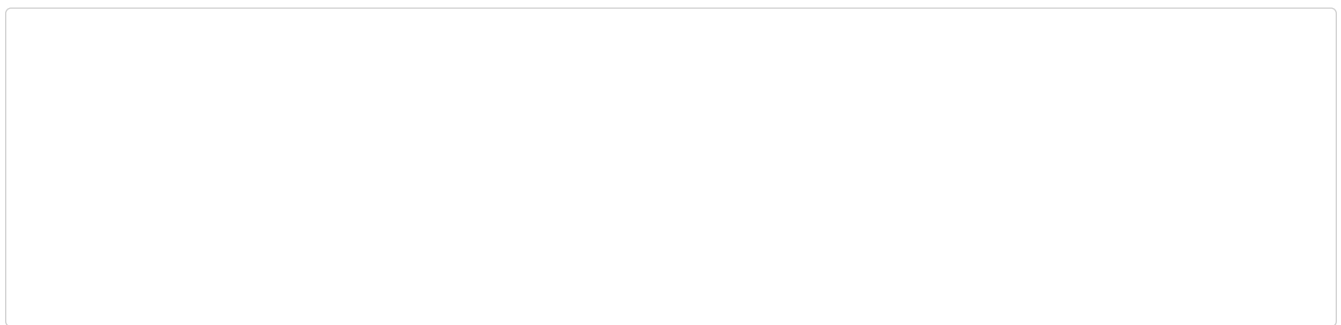


Figure 14. Web Server L } +, O Web Server List

9Z@K [ \$ Web Server % ) ž ( - I WAS List ä P3 'Start' VEE F) 1 2. å 1 ) ž @K[ \$ Web Server % 9Z ( - I \_\_: - , - 'Stop' VE p = ÝV± = / { VEE F) 1 2.

Web Server ) ž ¶ - \$ Web Server ) ž LogY Popup Np = Q" U2.

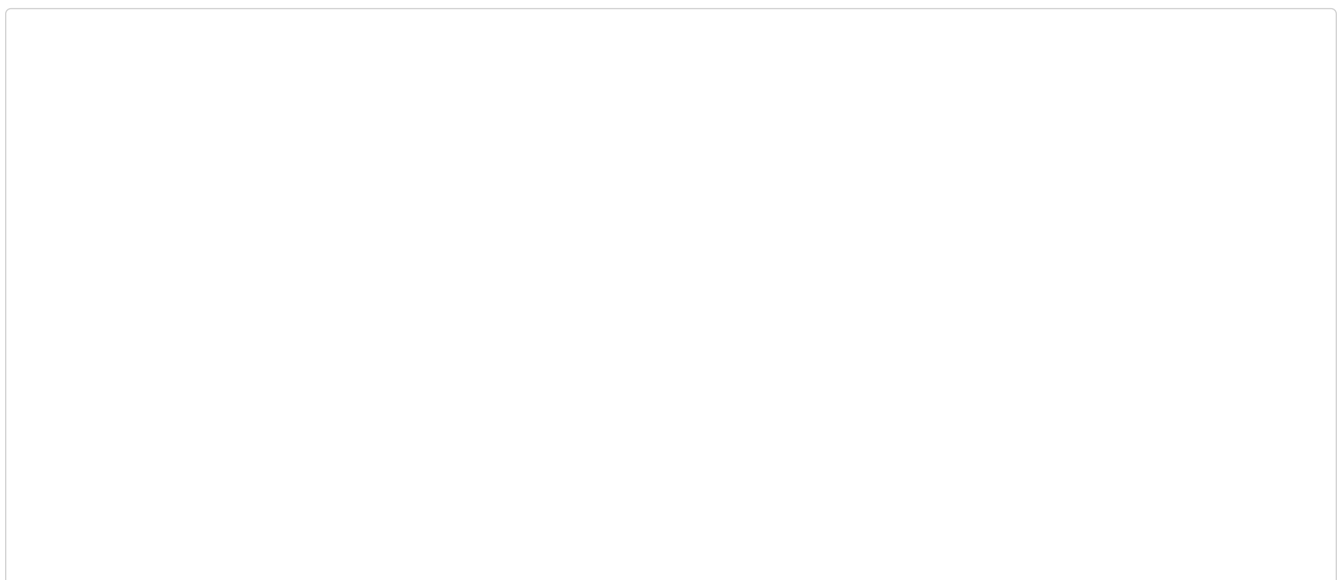


Figure 15. Web Server 3 ) ž Ä Log

## Web Server - WAS WX

Web ServerH WAS á &ž +L - . / X] ! 2. LENA Web Server H WAS 3 &ž : Web Server +L " I - # i j [ 2. LENA Manager } —3 'SERVER' ' C- # +, 1 Web Server % mn( • +L

" I E YG +L " I 8 } —3 'Connector' ZE mn1 2.

Web Server 3 'Connector' Z - # \$ Web Server H WAS á &[ - . 1 +LE NO1 2.

'Connector' Z " I ( —3 WAS List \ - &ž i WAS% GY( I ) ! oJ Web Server H WAS á &ž s 8ôU2.

WAS % GY( ) - / # \$ WAS List \ 3 '+' VEE F) ( I YO\$ ] " - # +, @K [ \$ WAS% mn( G 'Save' VEE F) 1 2.

] " - # \$ LENA Manager - , Š@K[ \$ WAS Node ; = WAS ŽŠE I J i j [ pæ s<sup>3</sup> 'Connector' - , Š1 WAS\$ Ms Z ¾\$2.

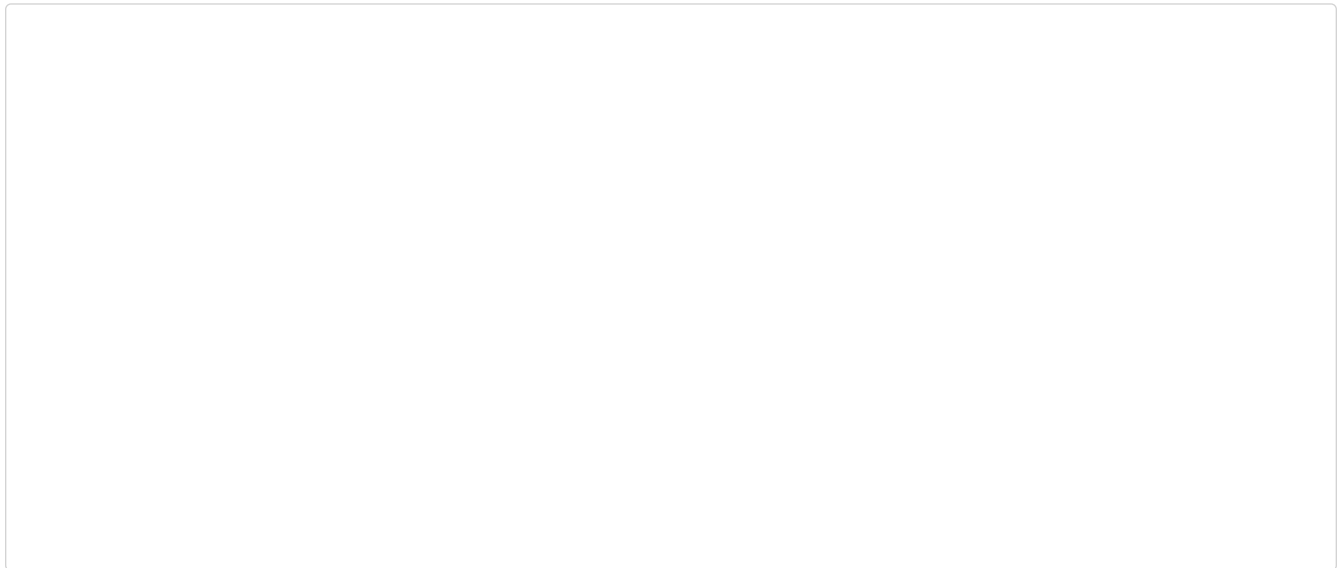


Figure 16. &ž i WAS GY

WAS List- &ž +Li WASY GY@I äP ( —3 'Save' VEE F) ( • ÄW Š` 1 2.

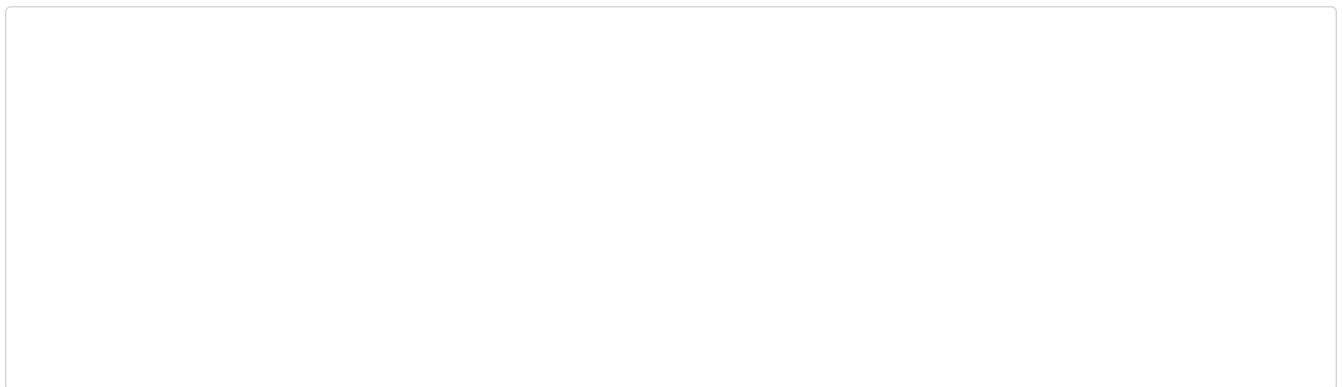


Figure 17. &ž i WAS ŽŠ Š`

### 3.1.6. Server ` WX I J

\* # [Web Server - WAS &ž](#) ÄLE Q/ # æk1 &ž +LE I J ( \$ ŸJE +~ 1 2.

LENA Manager - # \$ +, 1 Server 3 STE áí ( P I J i j [ <Š Topology View % >? ( G [ 2. s Topology ) 6E Q/ &ž s L} op= I J ( \$ ŸJ Ä Web Server, WAS +, ¶ ) ! ^>@K [ \$ LENA Sample \_sZ% Q/ &ž s L} op= @K[ \$ Z% I J i j [ 2.

Topology a bc I J

LENA Manager } —3 'Topoolgy' ' C% mn1 2.

Topology View - # \$ ) ! op= ...> , Š@K [ \$ Node H Node ; +, 1 Server 3 STÄ &ž LM% I J i j [ 2.

Web Server H WAS á &ž +Ls &[ mp= f...@G [ pœ s% Q/ Server á &ž s L} op=  
@B\$Z I J i j [ 2.

Sample Page Tde bc I J

LENA 3 Web Server H WAS - \$ ) ! ^>U Sample PageH Sample Application s [ 2. s \$ : )  
+, O L} &ž E I J ( \$ 9<=< ` 9' j [ 2.

` § Web Server 3 IPH Port% I J 1 ! a bdä §- ] ^H \_s D" 1 2.

http://[Web Server IP]:[Web Server Port]/index.html

^ c ] ^H \_s LENA - # >? ( \$ index.html \_sZY ŷQ@\$ ÑE I J i j [ pœ Web Server  
Y L} ŷQ@\$ ÑE I J i j [ 2.

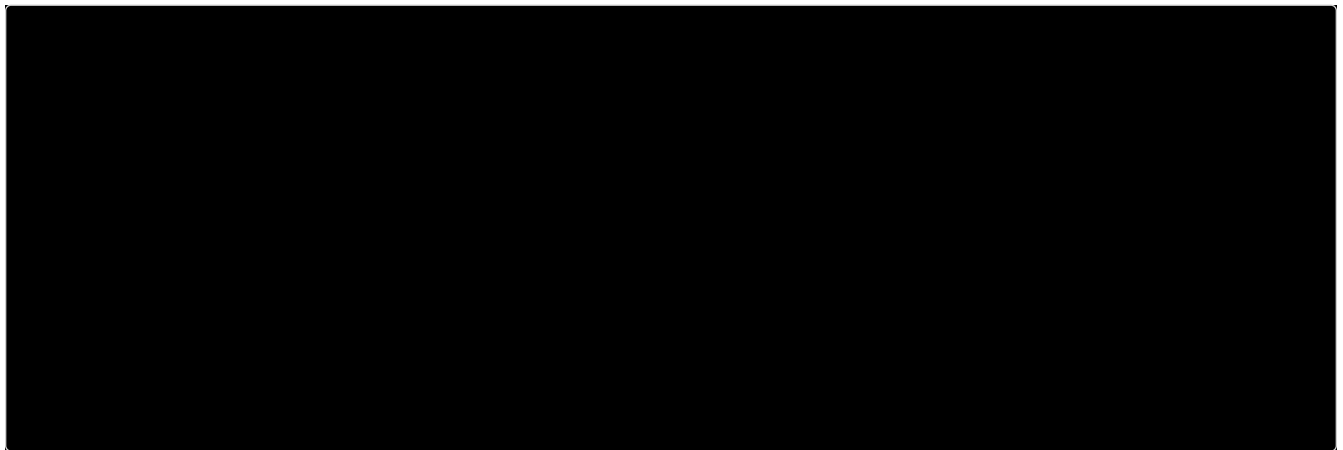


Figure 18. Web Server ŷQ Test

Sample Application Tde bc I J

LENA WAS% +, ( I LENA - # >? ( \$ ) ! Application s ^>@K [ 2. s Application3  
index.jsp % ŷQ( I WAS ŷQ dgÓ% j k i j [ 2.

Web Server H WAS Y +, : ) } ~= +L@K [ 2\$ YL ( - a bdä §- ] ^H \_s D" 1 2.

http://[Web Server IP]:[Web Server Port]/index.jsp

Web Server H WAS Y L} &[ s @K[ 2I Web Server 3 IPH Port = ŷQ1 - ab: WAS=  
4§@K index.jsp \_sZ% ab( P @G 2ÄÄ \_s LENA Sample Application - # >? ( \$ index.jsp  
\_sZY ŷQU2.

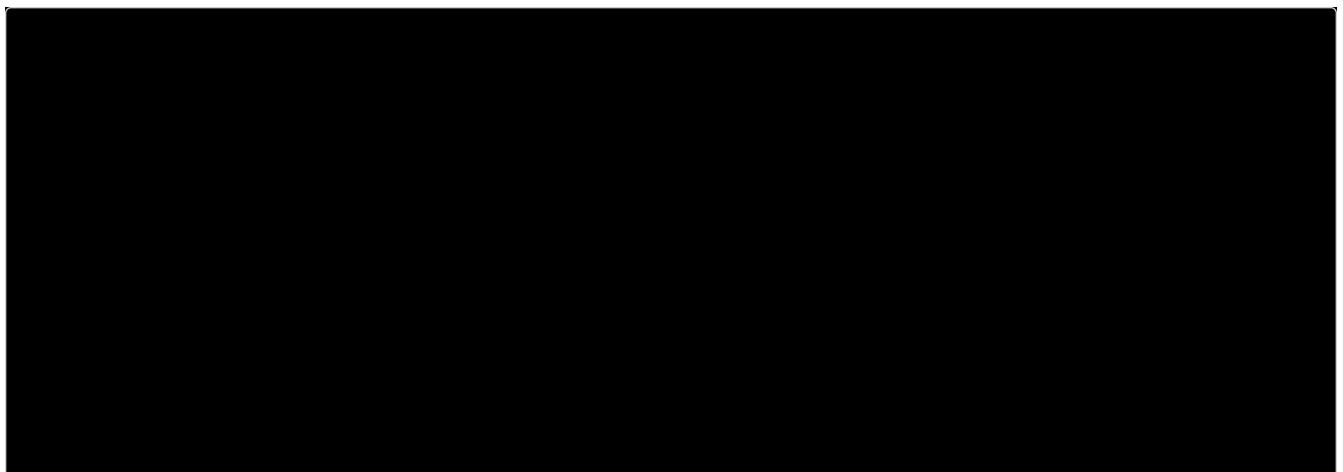


Figure 19. index.jsp ŷQ Test

index.jsp \_sZ% ŷQ( l ...> a bE Ke WAS Y ì O( \$Z% Server ID, Service Port, JvmRout  
² E Q/ l J i j [ 2.