

# Installation

LENA Support

Version 1.3.1.2

# Table of Contents

1. Overview .....	1
1.1. Overview .....	1
1.1.1. Server .....	1
1.1.2. Agent, Advertiser .....	1
1.1.3. Manager .....	1
1.2. Mechanism .....	2
2. Installation Prerequisite .....	4
2.1. Overview .....	4
2.1.1. Hardware Resource .....	4
2.1.2. OS .....	4
2.1.3. Network .....	5
2.1.4. Java .....	5
2.1.5. JVM .....	5
2.1.6. Network .....	5
3. Installation .....	8
3.1. Overview .....	8
3.1.1. LENA Manager / O .....	8
3.1.2. Node / O(Command Line) .....	11
WAS Node / O .....	11
Web Server Node / O .....	12
LENA ManagerU Node7 2~ (• •) .....	14
3.1.3. Node • p / O(LENA Manager Web UI) .....	15
3.1.4. WAS / O .....	16
3.1.5. Web Server / O .....	18
Web Server - WAS 2~ .....	20
3.1.6. Session Server / O ; 2~ .....	21
Standalone , a / OU WAS 2~ .....	21
Embedded , a / OU WAS 2~ .....	24
3.1.7. Server ~ 2~ V( .....	25
Topology * ] 5 V( .....	25
Sample Page - \I ] 5 V( .....	25
Sample Application - \I ] 5 V( .....	26

# Chapter 1. Overview

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

! " # \$ LENA 1.3.1 L 8 I ) MNA ) 4- K, 6 O P Q > <= I RS 5 6.

- ¥ LENA / O
  - T Linux ) &
  - T Windows ) & / O

## 1.1. ! " # \$

LENA\$ Web Server, WAS(Web Application Server), Session ServerU Web Server7 Status\* V( - \$ Node Agent, Application Server1 / ODW StatusXY\* BC- \$ AdvertiserU Z[ E 1\ BCD\$ ] ^ Z[ @\_( ManagerA \_` a 6.

### 1.1.1. Server

LENA1# BCD\$ #L7 bc\$ Web Server, Application Server, Session Server 3ded f 6. g #L7 =@\$ hi U Q 6.

- ¥ Web Server: j =E kl 1 mn Web Resource\* BC56. Application Serverd BC- \$ o=#pq7 FrontrsI tu-v#, wx' NA Load Balancing ; Yy z{ W(SSL)\* BC- \$ rsl tu56.
- ¥ Application Server: JavaA |` a o= #pq\* } u/BC 56.
- ¥ Session Server: Application Server~ j =E 7 • €I • e56.

### 1.1.2. Agent, Advertiser

Node, Server1 / ODW BW ; , f„ ... ) : I † ‡ - \$ Agent { 6.

- ¥ Node Agent
  - T Web Server ^ % , f„ ... Š{ „ \* < ^ - Ą Manager1\ BC56.
- ¥ Advertiser
  - T Application Server ^ % , f„ ... Š{ „ \* < ^ - Ą Manager1\ BC56.

### 1.1.3. Manager

Manager\$ Node AgentU Advertiser\* ] - Ą NodeU Server7 BW ; , f„ ... ) : • I BC- \$Web Application{ 6. 2Ž' NA hi U Q > ) : I BC56.

Table 1. LENA Manager • k ) :

%&	' (
Dashboard	¥ Server, Server Cluster • ' ¥ Notification V(

%&	' (
Server	¥ System (' [ ' Server " " ) • • /t X/– B
Server Cluster	¥ Server Cluster • • /t X/– B ¥ Server Cluster 1 • • s Server • • /– B ¥ Server Cluster 1 • • 5 Server / X p— ; ~ ) ™ ¥ Server Cluster / X š> ; œ• l ž 5 Snapshot ¥ Server Cluster 1 • • 5 Server Ÿ 7 Graceful Restart
Resource	¥ Reosource7 i ; • • /t X/– B Database / DataSource / MessageService(JMS) / Transaction(JTA) / Application / LoadBalancer(SLB) ¥ Resource* j = - \$ Server ¢• i ; • • /t X/– B
Diagnostics + (, f„ ...)	¥ Server1 25 { £ • ' , f„ ... ) : ¥ Server1 # ¤ ¥ 5 Event i ) :
Topology	¥ System? Server _` • ' i
Admin	¥ j =E ;   5 Z [ , j =E/  5/\$ G F `` ¥ j =E +, { © i ¥ n{ wq Z [ , • ' i ; > A <sup>a</sup>

## 1.2. Mechanism

LENA\$ Manager\* ] 3# Web Server/WAS \* , f„ ... ; ] ^Z [ - \$ ) : l BC56. { \* ž 3  
Noden\$ « ž A Agentd / OD\$Š { \* Node AgentnK 56. Node Agent\$ Manager7 j =E  
¬ - l 8® h Node1 / Oa Web Server/WAS \* BW- ° Noded / Oa Host/VM, Web Server 7  
, f„ ... XY\* ManagerA 8±56.

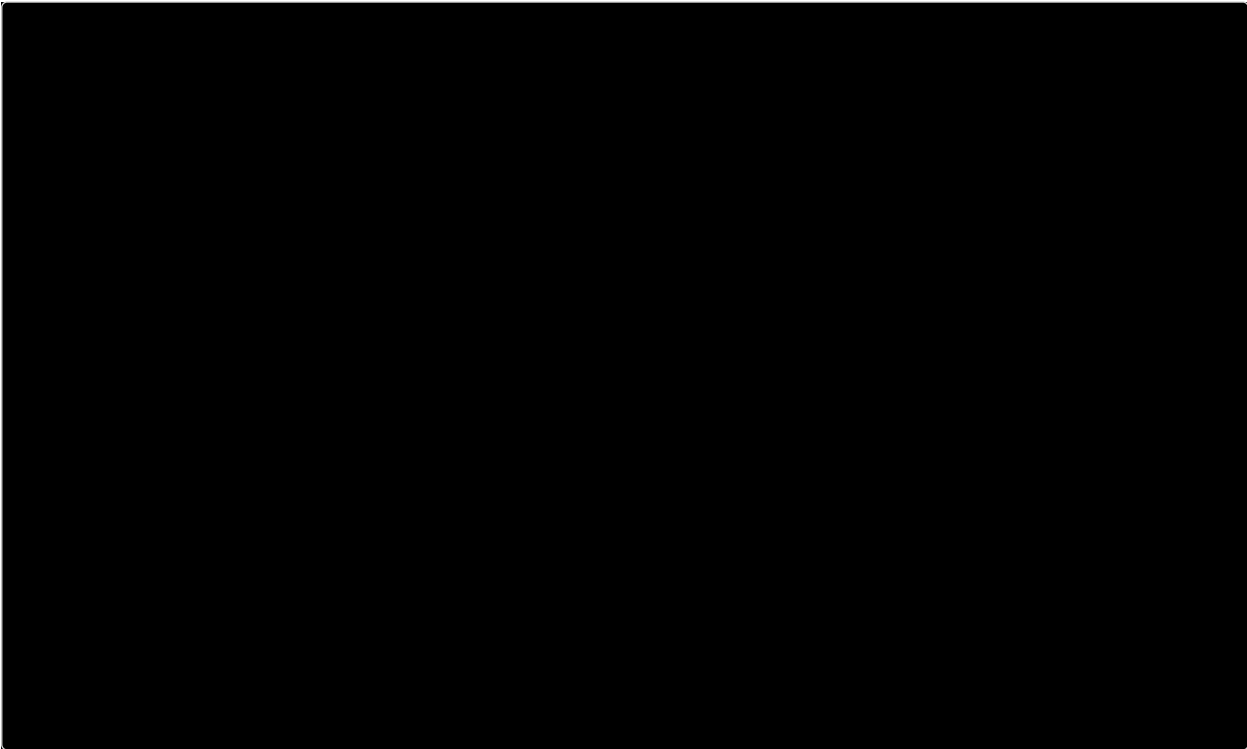


Figure 1. LENA Manager7 , f„ ... ; ] ^Z[ 7 | ~ 2 3

LENA Manager, Web Server, WAS ´ 1@ Manager7 ~ | I ž 3 j =D\$ Manager Repository, Session Clustering| ž 5 Sesssion Server, WAS7 , f„ ... XY t µI ž 5 Advertiserd | ~ - Œ Manager\* ] 5 , f„ ... ; ] ^Z[ d d: - @• 56.

%&	' (
Manager	# L 1 ¶ RD\$ / X· % Z [ ; Server , f„ ... ) : BC
Manager Repository	Manager + , I ž 5 · % , 1 Repository, gb / XXY ; DB XY * RSS
Node Agent	Web # L , f„ ... Š { „ < ^ ; Manager1 \ ± ° , ManagerA » „ t ° 5 BW // X ¬ - } u
Application Server	Application Server Instance
Web Server	Web Server Instance
Session Server	Session Server Instance
Advertiser	, f„ ... Š { „ < ^ ; Manager1 \ ± ° (Application Server1 ] ^)

# Chapter 2. Installation Prerequisite

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

### 2.1.1. Hardware Resource

#### ¥ CPU

8' NA \_~ - KE - \$ Web Application{ W¼ X@7 ` : I k\_- \$e1 ®½f 6. ) ! ' ( LENA #pq \_~ 1 ¾k 5 CPU\$ 2 Core { ^ I | K 56.

#### ¥ Memory

Memory1 23#\$ hi Ž\* J 56. Web Server\* B´5 , ¿ Module> JVM ) &NA ~ | - ÅA Heap Memory\* j =56. LENA1#\$ ) ! Heap Memory ÁI Å[ /X3 ÃÄN°, /O Å1 3‡ ÅNA /ODÆ ¾k 1 mn tX{ d: - 6. yX' ( +, I ž 3 - Æ7 Ç[ ' #L1 /OÈ , ¿ , É7 Heap Memory /X Å7 ^{ Ç[ #L7 ÊÆ \$, [ =ËY6 ĩ e ĩ @• • 756.

LENA Manager ; g Server /O1 25 Î ĩ k\_j Ð> 6OP Q6.

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

g Server /O Å ) ! Memory ) MNA /O D°, Memory /X> Î ĩ Memory { ^ NA /XÁI ÖÖ- Æ' =s t f 6.

### 2.1.2. 1 2 3 4

#### ¥ Linux

Redhat (RHEL, CentOS) 6.5 { ^ / Ubuntu 12.04 { ^ I e• - ° d¹ | K- \$ +, 9B{ 6. %&' ( x86 hÖÖÖ7 x` 1 Ø@• 2=Ë ] ^#L \_` Y6\$ , =Ë 6t7 #L1 ÛÚ /O- \$ ŪI | ¹ 56.

#### ¥ Windows

Windows 7 { ^ I e• 56. Linux/Unix ®[ Windows x` 1 mn LENA ModuleI BackgroundA ÜÝ) ž 3 Windows Service •• ) : I BC56. " Þe ĩ Nv LENA Module{ Ð^ ForegroundA } ua 6.



Linux/Unix1#\$ ) ! ' NA LENA ModuleI } uÅÔ) ž 5 qĭ ßà\* BC56. á Ñ OS ServiceA •• { ¾ks Å #L †‡Ed OS âÓ1 Ø\ ää /X3â 56.

#### ¥ Unix

Solaris, HP-UX, AIX\* e• 56. Unix7 ÓÝ Linux/WindowsU ®[ ° æ L8 ; Patchd ) ! BCDe ĩ N°, ¾k Å 3‡ OS7 L8 ? ç? èé\* ] 3 B| ; ¶IRD° { \$ ] ^' NA Ñ 2• 7 ĩ kÅ~{ ¾k - 6.

### 2.1.3. 56

LENA\* /O- ) 8 LENA /O ; ) ~ 1 { =5 êX{ ¾k - 6. ' ^5 { • d ë6v Yy ^ Root / Administrator êX> | KDe Í N° { \* ] 3 LENA\* } uÄì t ëNf ?@7 êXI Ä[ ¥` - @• 56.

■

X86 hÖÖÖ1# | KD\$ í \$ hfeá, áÑ 5 Ç[ #L1 #A 6î 6t7 > ï Åqð{ +, DK g Åqð ?A †‡ +, Ed \_ÜD° Åqð ~ äñ ] B\* ž 3 êXI Ù[ - Æ j =56K dX- E. { ò ÓÝ +, E êX ?(> ï Åqð ?)A Node\* \_` //O - Æ +, 3â - ° LENA Manager ó5 Åqð ?A \_` - \$ ÛI | K56.

### 2.1.4. 789:

LENA /O\* ôu- ) 1 . # { 8 «ê1# ¥` 5 êX{ { = d: 5 /O ööé[ \* Mp- Æâ 56. hi Ž\$ LENA1# By- \$ ööé[ \_` { ° j =E ?A X÷1 Ø\$ ööé[ \_` I { =- v a6. hi Ž\$ Linux/Unix ) MNA / ¬DøNÆ Windows7 ÓÝ C: - ž 1 ~ %- \ ööé[ \* \_` 56.

Table 2. Directory Requirement

! -	Directory	; <
LENA WAS Node(Binary)	/engn001/lena	
LENA WEB Node(Binary)	/engn001/lenaw	
Web Server, WAS Log	/logs001	logÓA Ù[ ¾k Å / X
Web Application Source	/sorc001	

K½s j Ð> log . %I Ù[ s Û( e Æ»{ 6. log\$ ?@ Ù[ /X- e Í Nv LENA Node d /OD\$ ÓA - ž 1 ) ! ¥` a6. log V( I ùú\ - v#@ Disk =Ë Z[ \* û- \ - ) ž 3# \$ log ööé[ 7 Ù[ \* | 1 56.

d: - 6v ?@ ´ 1 disk üýI Node, log, source ööé[ 1 Mount- Æ OS System , r P p[ - \$ ÛI | 1 56.

### 2.1.5. JVM

JDK7 ÓÝ LENA /O ôu- ) 8 ?@ Binary ý%A ! > OS1# BC- \$ Package /O Z[ E\* ] 3 /Od DW fWâ 56. LENA 1.3> OracleJDK/OpenJDK 8{ ^ I e• - ° JDK 6,77 ÓÝ LENA 1.21# e• 56.

!

OracleJDK7 ÓÝ 8u202 L8 " eá ï #A { =s t f 6.

### 2.1.6. Network

hi 6{ W" \$> LENA7 g Module~ ài %7 &' I Æ( ) @Ž{ 6. LENA Management Z\* ÓAU Web Service Z\* ÓAd ^ • + Ž• DWf 6.

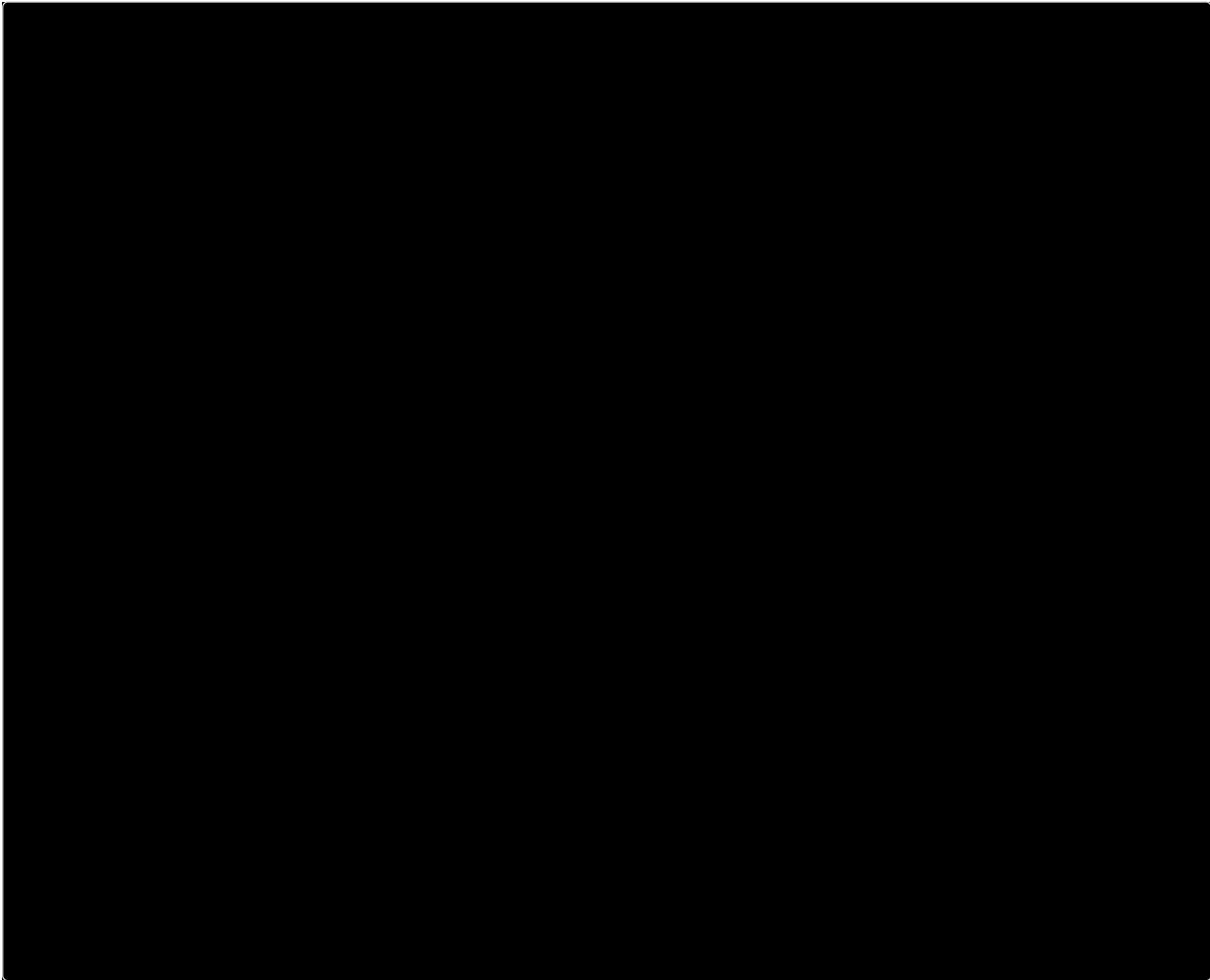


Figure 2. LENA Network Traffic

Ž 6{ W" \$1 Ž• a LENA , É ~ ài % ÓAU j = Port\$ hi ŽU Q6. ¬Åa Port , - \$ j 8 X7a ) ! Á{ ° g Module / O Å ?@A eXs t f 6. hi Ž\* JK- Æ Port\* wX5 . , j 81 z™ / I Open 3 Åhå 56.

!

LENA1 # j = - \$ Port\$ Yy kO ^ 1025{ ^ 7 Port\* { =56. « , #pq BC Å 80 Port • 7 Well-known Port\* { =3å 56v » • 1# BCD\$ 80Rà { = d{ a \* JK56.

Table 3. LENA Firewall Open Rule

Src	Dest	Protocol	Port	; <
+ , E	LENA Manager	TCP	7700	Manager Web UI ä 1
LENA Manager	WEB Node Agent	TCP	16900	WEB Node BW
	WAS Node Agent	TCP	16800	WAS Node BW



Src	Dest	Protocol	Port	; <
WEB Node Agent	LENA Manager	UDP	16100	, f, ... XY ±°
WAS Node Agent				
WAS Advertiser				
Session Server				
• , /+, E	Web Server	HTTP	8000	WEB #pq ä 1
		HTTPS	8363	WEB #pq Yy (SSL) ä 1 (HTTP + 363 / t Xd: )
+, E	WAS	HTTP	8080	WAS #pq ä 1
Web Server		AJP	8009	Web Server-WAS 2ê (HTTP - 71 / t Xd: )
WAS	Session Server	TCP	5180	Session Clustering
Session Server				
WAS	DB	TCP	3306	WAS JDBC ä 1

||

LENA\$ Web Server / WAS / O Å HTTP Port\* eX- Æ / O- @• - Kf 6. { HTTP Port\* ) MNA HTTPS Rà U Q> Server ~ | I ž 5 6î Port\* E~ êÚ- Æ / O- \$Š " 3Åd ž Ž1# { 45 9A ŽÅa Rà{ 6. mn#, Web Server, WAS\* 6t / O- \$ PX1# { Å j =a 6î Port U7 67I ² e- ) ž 3# 1P 107 E[ \$ Web ServerÆ WAS ? A ~ %- \, 1007 E[ \$ ÒÓ- Æ / O- \$ ÛI | ¹ 56.

Table 4. IPd Q> ¹ p1 Web Server, WAS / O Å HTTP Port / X 3Å

_Û	Server ⇐	HTTP Port	pK
WAS	ee_01	8080	-
	ee_02	8180	ee_01 7 HTTP Port Å + 100
Web	web_01	7180	-
	web_02	7280	web_01 7 HTTP Port Å + 100

ó5 Dynamic Port Range\* 89 Port 8ž A j =- e 9 ÛI | K56. LENA ) ~ 1 ¾k 5 Port\* OS7 6î Serviced Source PortA : • - \$ % { ¨¥s d: ` { f 6.

# Chapter 3. Installation

## 3.1. LENA ' =

LENA /O· %I 2^ #L7 Mpa ööé[ 1 > Aª 56. /O· %I ] 3 LENA Manager\* /O- KE - \$ Server1 LENA Manager\* /O- K Web Server\* /Os Server1 Web Server Node\* , WAS\* /Os Server1 WAS Node\* /O56.

!

LENA /O\* ôu - ) 1 . # JVM I J - Æ JDK\* Â[ /O- @• 56.

Node7 /O ; Web ServerU WAS7 /O\$ LENA Manager7 Web UI\* ] 3# /O56. LENA /O · %> B< \_ÛP =@1 mn 6OP Q{ \_Ûa 6.

Table 5. LENA /O· % \_Û (OS: Linux/Windows 64bit / LENA: 1.3.1.0 ) M)

4 > ! - (Edition)	OS ! -	' = ?@	; <
Enterprise	Linux	lena-enterprise-linux_na_x86_64-1.3.1.0.tar.gz	LENA Manager, WAS /O=
	Windows	lena-enterprise-win_na_x86_64-1.3.1.0.zip	
Standard	Linux	lena-standard-linux_na_x86_64-1.3.1.0.tar.gz	
	Windows	lena-standard-win_na_x86_64-1.3.1.0.zip	
-	Linux	lena-web-linux_na_x86_64-1.3.1.0.tar.gz	Web Server /O=
	Windows	lena-web-win-na_x86_65-1.3.1.0.zip	

#

Enterprise EditionP Standard Edition7 = { \$ + , E FGH7 Server Module \* JK 56.

LinuxU Windows 1 # 7 LENA /O\$ > &' 1 # \$ ~ %5 ² ³ NA ôua 6. ! " # 1 # \$ Linux\* ) MNA / ¬ 56.

### 3.1.1. LENA Manager ' = /AB

LENA /O ?Ôe\$ @A· % ÿ³ NA, /Os #L1 > Aª ; 1 @AI 3B- Æ j = 56. LENA Manager\$ WAS Node /O· %1 RSDW f N° /Os ÓA(3: /engn001/lena)1 /O· %I > Aª ; @AI B6.

#

LENA Manager\$ WAS Node /O· %1 RSDW f 6.

' = CDE ' = ?@ FDG HI

```
Ê[I ena]# cd /engn001/I ena
Ê[I ena]# ll
Ê-rw-rw-r-- 1 I ena I ena I ena-enterpri se-l inux_na_x86_64-1. 3. 1. 0. tar. gz
```

!

@A 3B Å /O· %7 V¹ E » ÛI B´ 5 ÆCe { ' NA ööé[ d ¥` D\$Š { ööé[ ¬I 1.3 NA ~D- \ ÒÓ- Æj = 56.

' = ? @ J K L 4 / 7 8 9 : ( MC

```
Ê[lena]# tar -xvzf l ena-enterpri se-l i nux_n a_x86_64-1.3.1.0. tar. gz
Ê[lena]# mv l ena-enterpri se-l i nux_n a_x86_64-1.3.1.0 1.3
Ê[lena]# ll
Êdrwxr-xr-x 12 l ena l ena 1.3
Ê-rw-rw-r-- 1 l ena l ena l ena-enterpri se-l i nux_n a_x86_64-1.3.1.0. tar. gz
```

install.sh(3: /engn001/lena/1.3/bin/install.sh) · %l { = - Æ / O - °
6OP Q> ¬ - W\* j = - Æ / O s t f 6.

LENA Manager ' =

```
[lena]# cd /engn001/lena/1.3/bi n
[lena]# ./install.sh create lena-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 : lena, wasadm
+-----+
-----
Input SERVICE_PORT for execution. (q: qui t)
Default value is '7700'
7700
```

LENA Manager / Od E # Dv install.sh l } u5 ööé[ 1 LENA Manager U Z \* a Script · %{
¥` a 6.

Table 6. LENA Manager Z [ = Script · %

Script ? @ (	' (
start-manager.sh	LENA Manager * Å   56.
ps-manager.sh	LENA Managerd } uF ( e V ( 56.
stop-manager.sh	LENA Manager * F e 56.

start-manager.sh l } u - Æ LENA Manager\* Å | 56.

```
[lena]# ./start-manager.sh
```

```
-----
Ê          LENA Manager
-----
```

```
Using LENA_HOME      : /engn001/l ena/j adeu3/1.3
Using JRE_HOME       : /engn001/j ava/j dk1.8.0_202
Using SERVER_PID     : /engn001/l ena/j adeu3/1.3/modules/l ena-manager/l ena-
manager_sol manager. pid
Using SERVER_HOME    : /engn001/l ena/j adeu3/1.3/modules/l ena-manager
Using SERVER_ID      : l ena-manager
Using INSTANCE_NAME  : l ena-manager_sol manager
LENA started.
```

LENA Managerd X^ ' NA } uDv 3‡ # L 7 Service PortA Manager1 ä 1 s t f 6.  
[http://Server\\_IP:7700](http://Server_IP:7700)

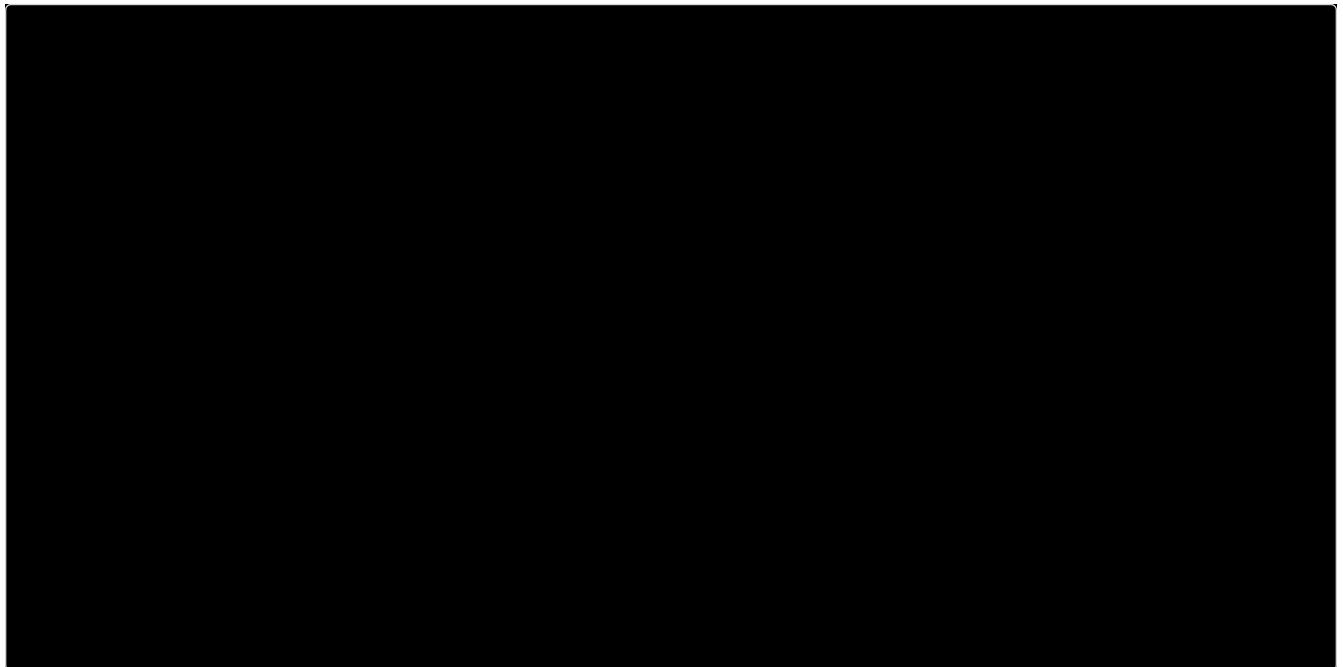


Figure 3. LENA ä 1 ™v

hi 7 G) ä 1 êX/pH, - A ä 1 - v G) ™vI V( s t f 6.

N/ OP 56/; QRS

admin / ladmin1234

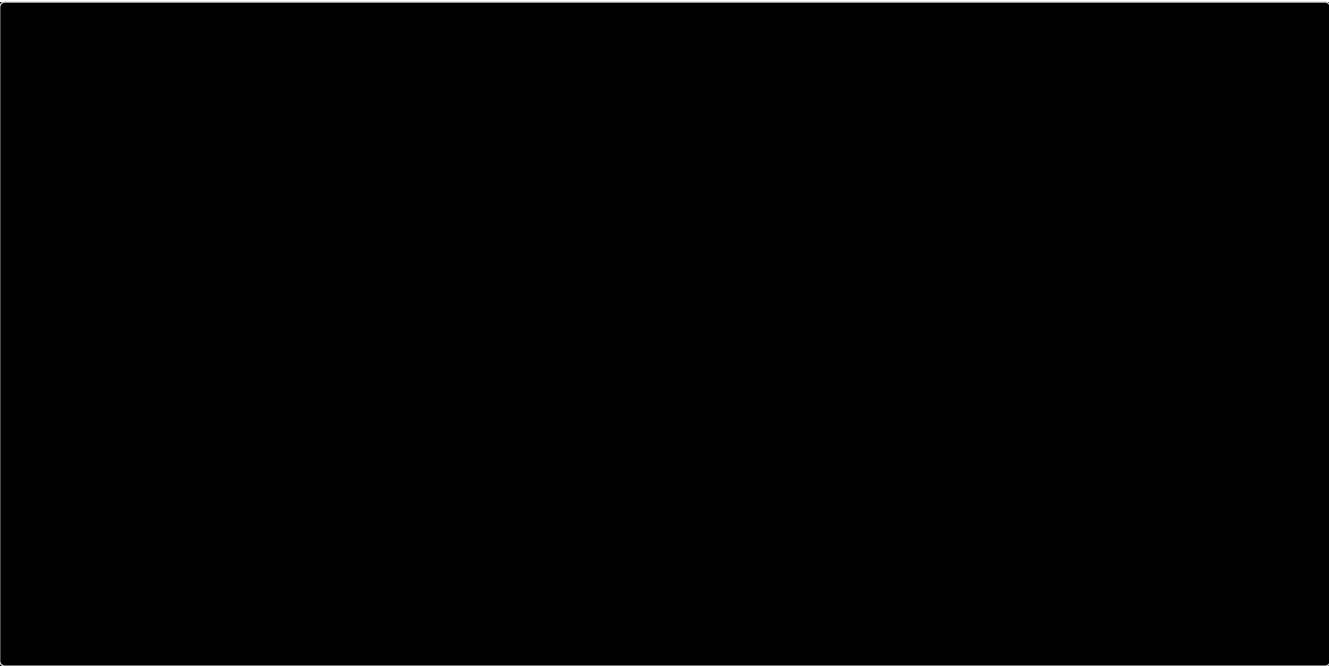


Figure 4. LENA G) ™v (DASHBOARD)

3.1.2. Node ' ' = (Command Line)

Node7 / O\$ LENA / O ? Ôe 7 @AI I \$ ŪP Q6. WAS, Web Server\* / Os #L1 g / O  
? Ôe \* Mp5 ÓA(3: /engn001/lena ó\$ /engn001/lenaw)1 > A<sup>a</sup> ; @AI 3B56.  
Node\* / O- v hi U Q{ Node Agent\* } u, F e, ^ %V( I - ) ž 5 scriptd J K 56.

Table 7. Node Agent Z [ Script

script CD	script (	; <
Node / OÓA - ž 'bin' (3: /engn001/lena/1.3/bin)	start-agent.sh	Node Agent } u
	ps-agent.sh	Node Agent L A • q V(
	stop-agent.sh	Node Agent F e

WAS Node ' ' =

WAS Node7 / O Å K½s t f \$ j Ð> 6OP Q6.

- 1. LENA ManagerU WAS Node\* Q> Server1 / O
- 2. LENA ManagerU WAS Node\* 6î Server1 / O(LENA Manager Mß / O)

1, 7 ÓÝ [LENA Manager / O/}](#) u 1# LENA Manager\* / O- ) ž 3 WAS Node / O ? Ôe 7  
@AI NøNÀA { Å WAS Noded / ODW f \$ ^ %o{ 6.

2, 7 ÓÝ WAS Node\* / Os Server7 Mp5 ÓA(3: /engn001/lena)1 LENA WAS / O ? Ôe \*  
> A<sup>a</sup> ; 6OP Q{ @AI NW / O56.

/ O ÓA ; / O · % > A<sup>a</sup> V(

```
Ê[I ena]# cd /engn001/I ena
Ê[I ena]# ll
Ê-rw-rw-r-- 1 I ena I ena I ena-enterpri se-l inux_na_x86_64-1.3.1.0. tar.gz
```

!

```
@A 3B Å /O· %7 V¹ E » ÛI B´ 5 ÆCe { ' NA ööé[ d ¥` D$Š
{ ööé[ ¬I 1.3 NA ~D- \ ÒÓ- Æj =56.
```

```
/O· %@A 3B / ööé[ ¬ ÒÓ
```

```
Ê[Iena]# tar -xvzf Iena-enterpri se-l inux_na_x86_64-1.3.1.0.tar.gz
Ê[Iena]# mv Iena-enterpri se-l inux_na_x86_64-1.3.1.0 1.3
Ê[Iena]# ll
Êdrwxr-xr-x 12 Iena Iena 1.3
Ê-rw-rw-r-- 1 Iena Iena Iena-enterpri se-l inux_na_x86_64-1.3.1.0.tar.gz
```

```
Node* /OO6v start-agent.shA Node Agent* } u56.
```

```
Node Agent } u
```

```
[Iena]# cd /engn001/Iena/1.3/bi n
[Iena]# ./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 : Iena):
Iena #

-----
Ê          LENA Agent
-----

Usi ng LENA_HOME      : /engn001/Iena/1.3
Usi ng JAVA_HOME      : /engn001/j ava/j dk1.8.0_202/j re
Usi ng CONF_FILE      : /engn001/Iena/1.3/conf/agent.conf
Usi ng LOG_HOME       : /engn001/Iena/1.3/l ogs/Iena-agent
Usi ng RUN_USER       : Iena
Usi ng PORT           : 16800
Usi ng UUID           : 98449860-0a9a-323b-9766-98c4292000df
LENA Agent is started.
```

```
Node Agent } u Å P©` $ Ð¢ > 6OP Q6.
```

```
¬ JAVA HOME (jdk) ÓA P©
¬ Node Agentd j =s Port P©
¬ Node Agent } u OS êX P©
```

```
Web Server Node ' =
```

```
Web Server* /Os Server1 LENA Web Server /O= ?Ôe* > Aª ; @AI NW /O56.
```

ÓA / · % V (

```
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_64-1.3.1.0.tar.gz
```

/O· % @A 3B / ööé[ ¬ ÒÓ

```
Ê[l enaw]# tar -xvzf l ena-web-l inux_na_x86_64-1.3.1.tar.gz
Ê[l enaw]# mv l ena-web-l inux_na_x86_64-1.3.1 1.3
Ê[l enaw]# ll
Êdrwxr-xr-x 12 l ena l ena 1.3
Ê-rw-rw-r-- 1 l ena l ena l ena-web-l inux_na_x86_64-1.3.1.0.tar.gz
```

#

@A 3B Å /O· %7 V¹ E » ÛI B´ 5 ÆCe { ' NA ööé[ d ¥` D\$Š  
{ ööé[ ¬I 1.3 NA ~D- \ ÒÓ- Æj =56.

Node\* /O 5 ; start-agent.shA Node Agent\* } u56.

Node Agent } u

```
[l ena]# cd /engn001/l enaw/1.3/bi n
[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 enaw/1.3
Usi ng JAVA_HOME      : /engn001/j ava/j dk1.8.0_202/j re
Usi ng CONF_FILE      : /engn001/l ena/1.3/conf/agent.conf
Usi ng LOG_HOME       : /engn001/l ena/1.3/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 } u Å P©` \$ Ð¢ > 6OP Q6.

¬ JAVA HOME (jdk) ÓA P©

- Node Agentd j =s Port P©
- Node Agent } u OS ê X P©

LENA ManagerT NodeU VW(XY)

WAS NodeU Web Server Node\* / O- K Agent\* ) ~ - v LENA Manager\* ] 3 Node\* •• s t f 6.

LENA Manager7 ^ « 'SERVER' § G\* wx - v Node List\* V( s t f 6.

Node •• I ž 3 'Register' LQI R5- v hi U Q{ Node\* •• - ) ž 5 Empty Rowd SdD° g P© Đ¢I •• 56.

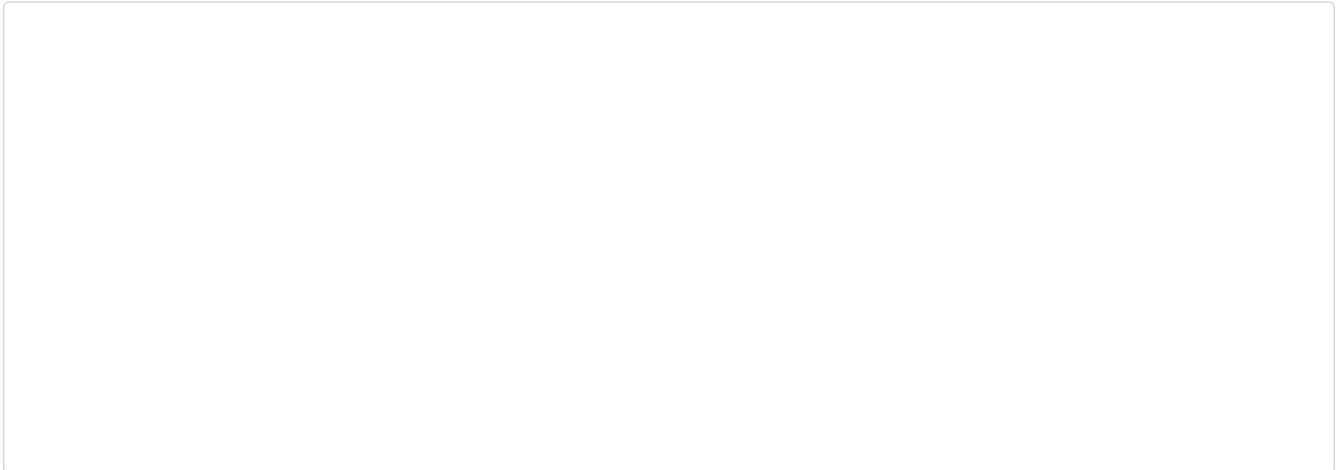


Figure 5. SERVER § G G) ™v

Node •• Å P©s Đ¢ > 6OP Q6.

1. Node Name: •• s Node7 →T
2. Node Type: Application / Web F 1 wx
3. Node IP: Noded / Oa Server7 IP Adress
4. Node Port: Node / OÅ P©5 Node Port

Manager Address Đ¢7 ÓÝ LENA Managerd / Oa Server7 IPd E~ P© DÀA ?@ P©s ¾k \$ ë 6.

P© Đ¢I , U P©5 . 'Save' LQNA Node •• I E# - ° X^ Ö[ Å hi U Q> ™vI V( s t f 6.

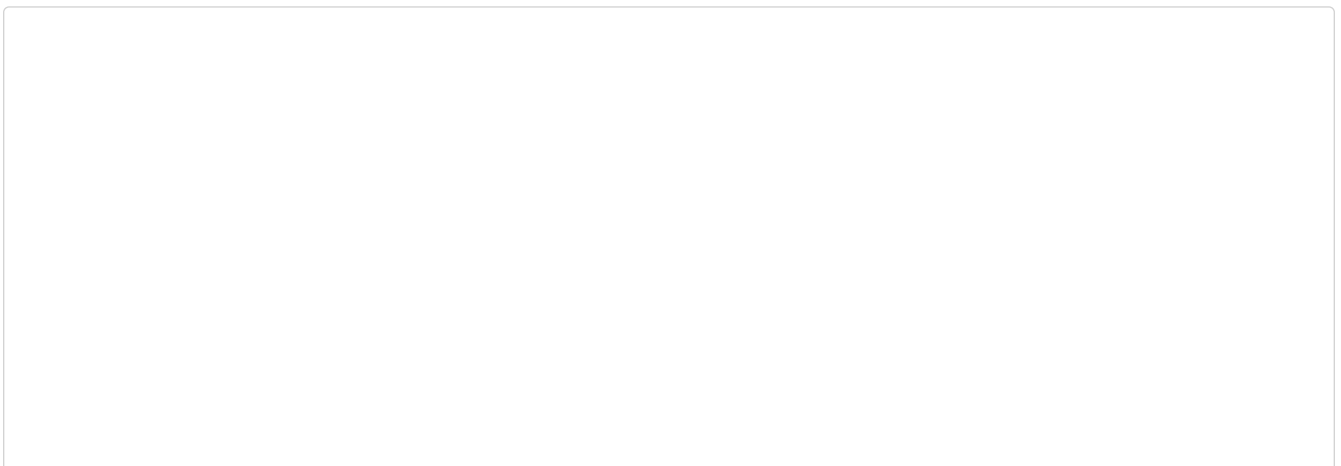


Figure 6. Node X^ •• 3Å ™v



3.1.3. Node Z [ ' = (LENA Manager Web UI)

Node7 / O\$ Node / O(Command Line) 1# ô5 ² V ´ 1@ LENA Manager\* ] 3 • pNA / Os t@ f 6. { \* ž 3#\$ LENA (Manager)\* / O5 Server7 xX ööé[ y1 LENA / O· %(WAS, Web Server)\* > Aª 3 UWå 56. / O ? Ôe\* > Aª 3 UWå - \$ ÓA7 3Å\$ 6OP Q6.

Table 8. Node • p / O\* ž 5 / O· % > Aª ÓA(3Å)

LENA ' = CD	LENA ' = \ ] ^ F DG CD
/engn001/lena/1.3 (LENA_HOME)	[LENA_HOME]/repository/install-files/default

3‡ ÓA1 . # j = 5 WAS, Web Server / O· %l > Aª 56.

• p / O\* ž 5 / O ? Ôe V(

```
[lena]# cd /engn001/lena/1.310/repository/install-files/default
[lena]# ll
-rw-rw-r--. 1 lena lena lena-enterprise-linux_na_x86_64-1.3.1.0.tar.gz
-rw-rw-r--. 1 lena lena lena-web-linux_na_x86_64-1.3.1.0.tar.gz
```

3‡ ÓA1 / O ? Ôe\* > Aª O6v LENA Manager7 'SERVER' §G\* wx - K - « 7 'Install' LQI R556.



Figure 7. WAS Node • p / O 3Å

Node • p / O Å P©3å - \$ Ð¢ > 6OP Q6.

- 1. Node Type: Application / Web F1 wx
- 2. Node Name: • p Server1 / Os Node7 ¬T
- 3. Node Address: Node\* / Os • p Server7 IP Adress
- 4. Node Port: • p Server1 # Noded j =s Port
- 5. User: • p Server7 OS êX
- 6. Password: • p Server7 OS êX7 pH, -
- 7. SSH Port: • p Server7 SSH Port
- 8. LENA Home: • p Server1 Node\* / Os ÓA
- 9. Java Home: • p Server1 / ODWf \$ JAVA Home ÓA

• p /O1# P©- \$ ĀI é2A, LENA Manager\$ . # Ā[ Mp3W /O ?Ôe . %I • p  
 ServerA 8±- K Node\* /O- K, /O5 Node7 Agent\* E~ NA } u- \$ ŪNA • p /O\$  
 E#a6. { X5 ôu ^ ' > Popup YI ] 3 V( s t f 6.

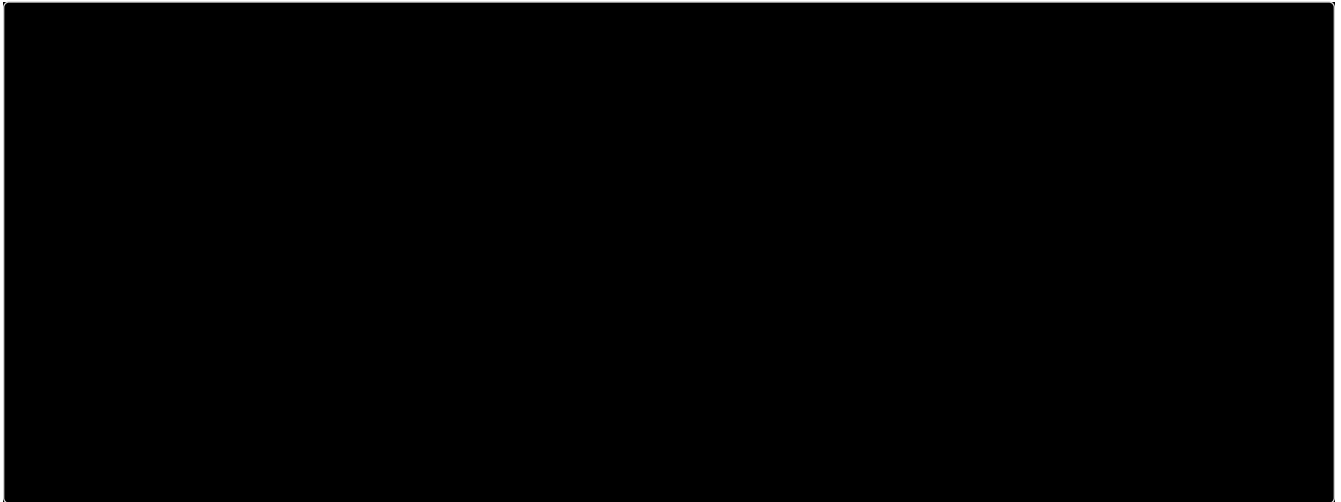


Figure 8. WAS Node • p /O ôu V( 3Ā

/Od X^ ' NA E#Dv • p /O5 Node\$ LENA Manager1 E~ NA • • a6.

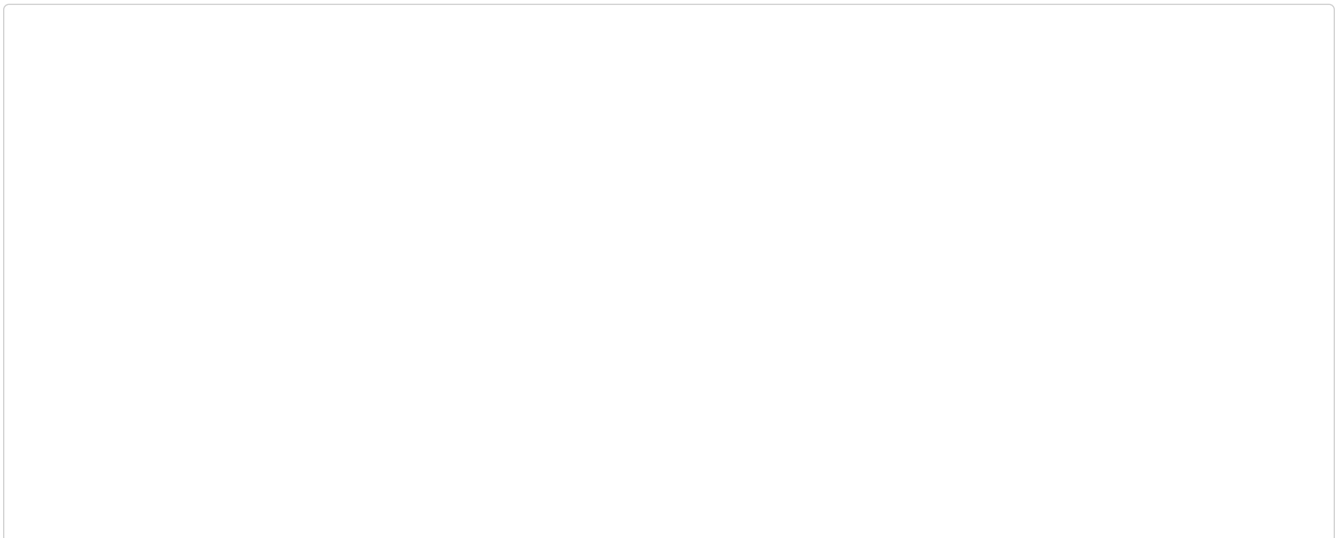


Figure 9. Node • p /O ; • • E#a ^ % 3Ā

■

=== Node7 • p /O\* ž 3#\$ LENA Managerd /Oa ServerU • p /Os  
 Server ~ 7 SSH Port ²™/{ Open DWf Wå 56. ===

### 3.1.4. WAS ' =/AB

WAS Node\* /O, • • " e E#O6v { B LENA Manager Web UI\* ] 3 WAS \* /Os t f 6.  
 LENA Manager ^ « 7 'SERVER' §G\* wx 5 . Z[ 1# WAS \* /Os WAS Node\* wx - v  
 WAS List\* V( s t f 6. { ™v 1# 'Install' LQI R556.

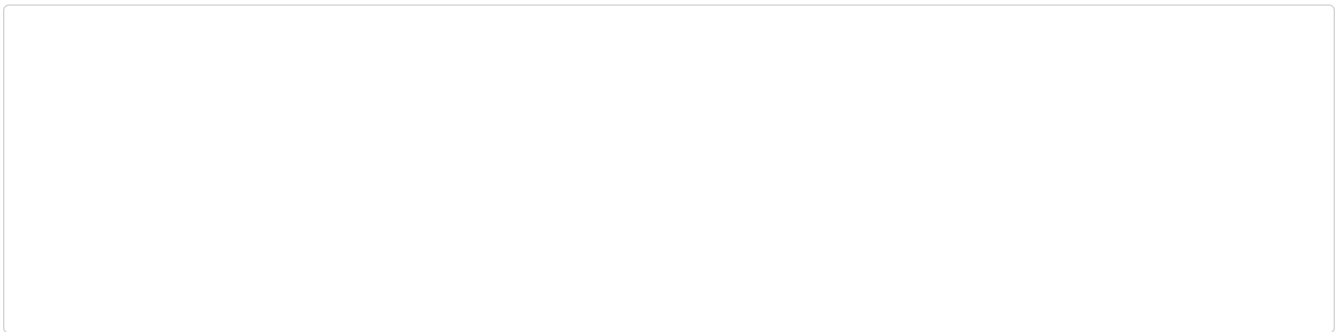


Figure 10. WAS List V (

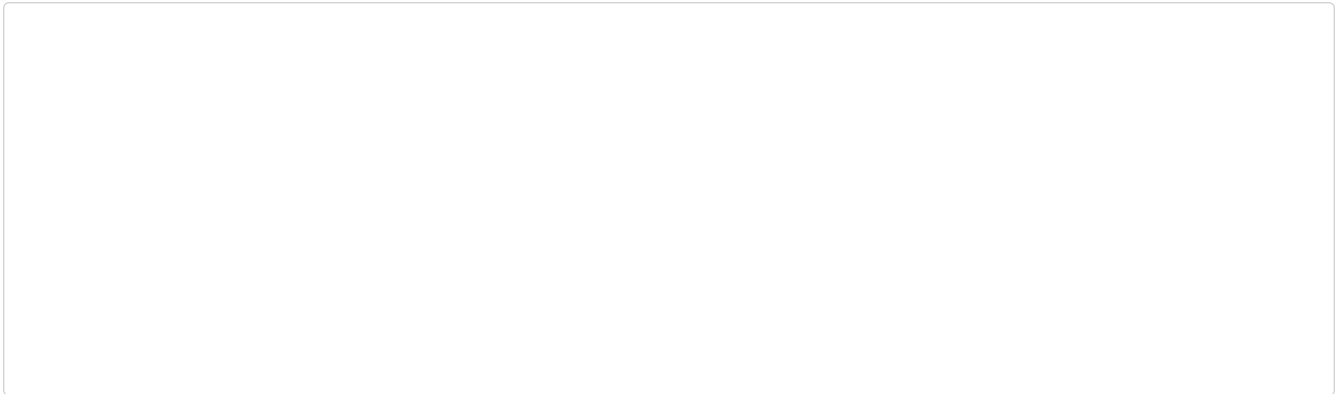


Figure 11. WAS / OXY P© Popup P P© Å 3Å

'Install' LQI R5- v WAS\* /O- ) ž 5 XY\* P©- \$ Popup Y{ \©D° g P©Đ¢> 6OP Q6.

1. Server Type: WAS7 Type, Standard / Enterprise F x
2. Node: WAS d / OÈ Node(t X] d)
3. Server ID: LENA Manager d WAS\* ³ ? - ) ž 5 ¬T
4. Service Port: WASd / OÈ ^ ) M{ D\$ HTTP Port\* 7 Å
5. Run User: WAS 7 ) ~ Å j =s OS êX(t X] d)
6. Install Root Path: WAS d / OÈ ÓA(t X] d)
7. Log Home: WAS Log7 ÓA
  - a. default: [Install Root Path]/logs
  - b. cutom: j =Ed \_7A ÓA eX
8. JVM Route: Web ServerU 2~ Å Web Server d WAS\* ³ ? - ) ž 5 Å
  - a. auto: LENA1 # E~ ¥`
  - b. manual: j =Ed \_7A eX



=== WAS \$ ) ~ Å HTTP, HTTPS, AJP • 6` 5 Port\* j =- \$Š LENA 1 # \$ WAS /O Å j =E û7\* ž 3 HTTP Port áI P©¬ K { \* ) MNA 6î Port ÅI E~ êÜ- Ć /O56. ===

WAS /O XY\* , U P© 5 . 'Save' LQI R5- v WASd /OD° WAS List 1 # /O5 WAS \* V( s t f 6.



Figure 12. WAS X^ / O ; WAS List

F eDW f \$ WAS \* ) ~ - ½v WAS List Ý[ 7 'Start' LQI R556. ó5 ) ~ DWf \$ WAS \*  
F e - ½v Q> ž O1 'Stop' LQNA í aÀA 3‡ LQI R556.

WAS ) ~ Å1 \$ WAS ) ~ Log(Application { ¶ RDW f 6v Application ) ~ Log @ Sb)d Popup  
YNA \ ©a 6.

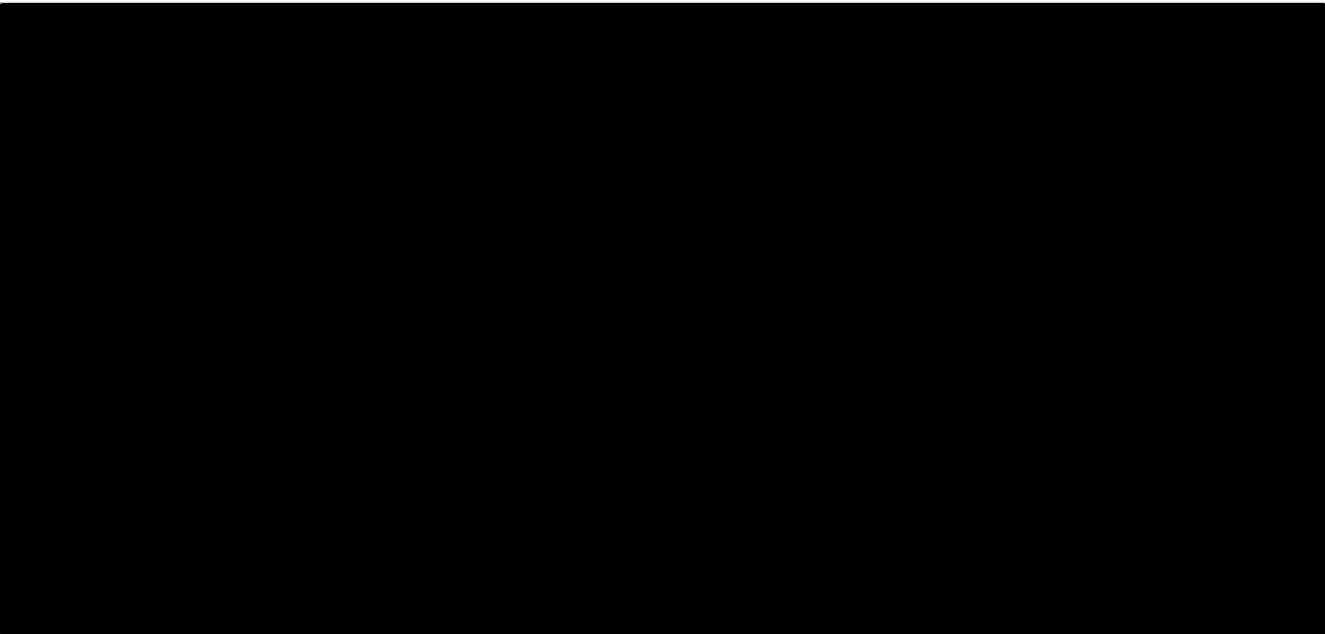


Figure 13. WAS7 ) ~ P Log

3.1.5. Web Server ' =/AB

WAS /OU ~ %5 ² ³ NA, LENA Manager Web UI\* ] 3 Web Server\* /Os Web Server Node\*  
wx 5 . Web Server\* /Os t f 6.

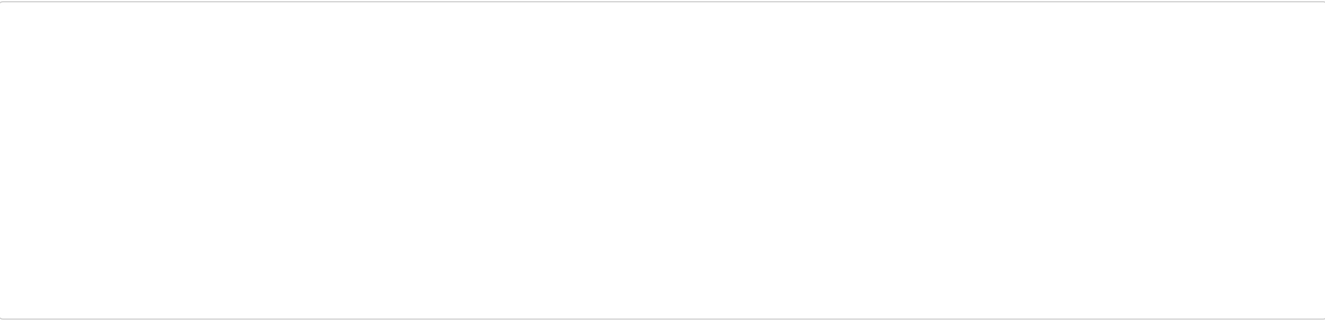


Figure 14. Web Server List V (

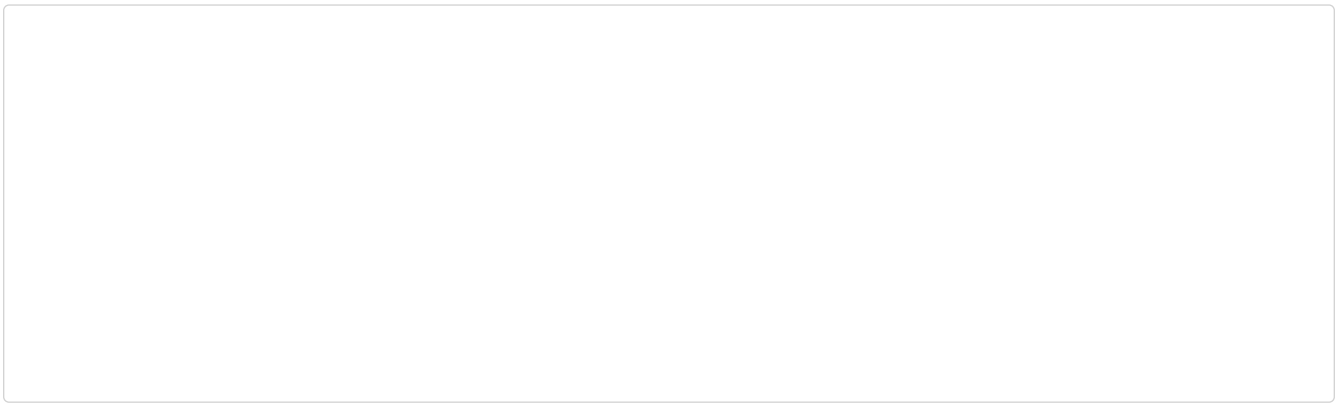


Figure 15. Web Server / OXY P© Popup P P© Á 3 Å

'Install' L QI R5- v Web Server\* / O- ) ž 5 XY\* P©- \$ Popup Y{ \©D° g P©Đ¢> 6OP Q6.

1. Server Type: Web Server (K X)
2. Node: Web Server d / OÈ Node (t X] d)
3. Server ID: LENA Manager d Web Server \* 3 ? - ) ž 5 -T
4. Service Port: Web Server d j =s HTTP Port
5. Run User: Web Server ) ~ Å j =s OS ê X(t X] d)
6. Web Server Engine Path: Web Server / O Å j =s Engine ÓA(t X] d)
7. Install Root Path: Web Server d / OÈ ÓA(t X] d)
8. Log Home: Web Server Log ÓA
  - a. default: [Install Root Path]/logs
  - b. custom: j =E d \_ 7A ÓA e X



Web Server \$ ) ~ Å HTTP, HTTPS • 6` 5 Port\* j =- \$Š LENA 1 # \$ Web Server / O Å j =E ù 7\* ž 3 HTTP Port áI P©- K { \* ) MNA 6î Port ÁI E~ ê Ú- Ć / O56.

Web Server / O XY\* , U P© 5 . 'Save' L QI R5- v Web Serverd / OD° Web Server List 1# V( s t f 6.

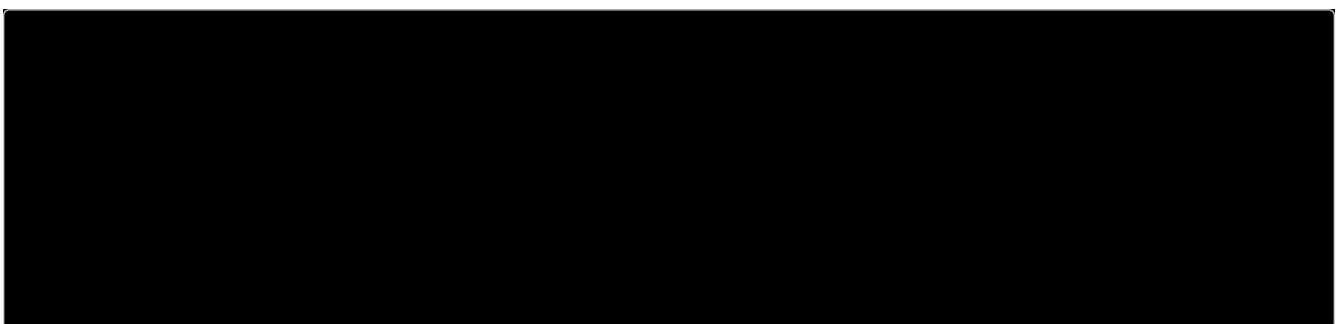


Figure 16. Web Server X^ / O ; Web Server List

F eDW f \$ Web Server \* ) ~ - ½v WAS List Ý[ 7 'Start' L QI R556. 65 ) ~ DWf \$ Web Server \* F e- ½v Q> ž O1 'Stop' L QNA í a ÅA 3 ‡ L QI R556.

Web Server ) ~ Å 1 \$ Web Server ) ~ Logd Popup YNA \ ©a 6.



Figure 17. Web Server 7 ) ~ P Log

### Web Server - WAS VW

Web ServerU WAS ~ 2~ /X1 23 ch! 6. LENA Web Server U WAS 7 2~ > Web Server /X™v1# s t f 6. LENA Manager ^ « 7 'SERVER' §G1# /O5 Web Server \* wx - Æ /X™vI dK /X™v < ^ « 7 'Connector' eI wx56.

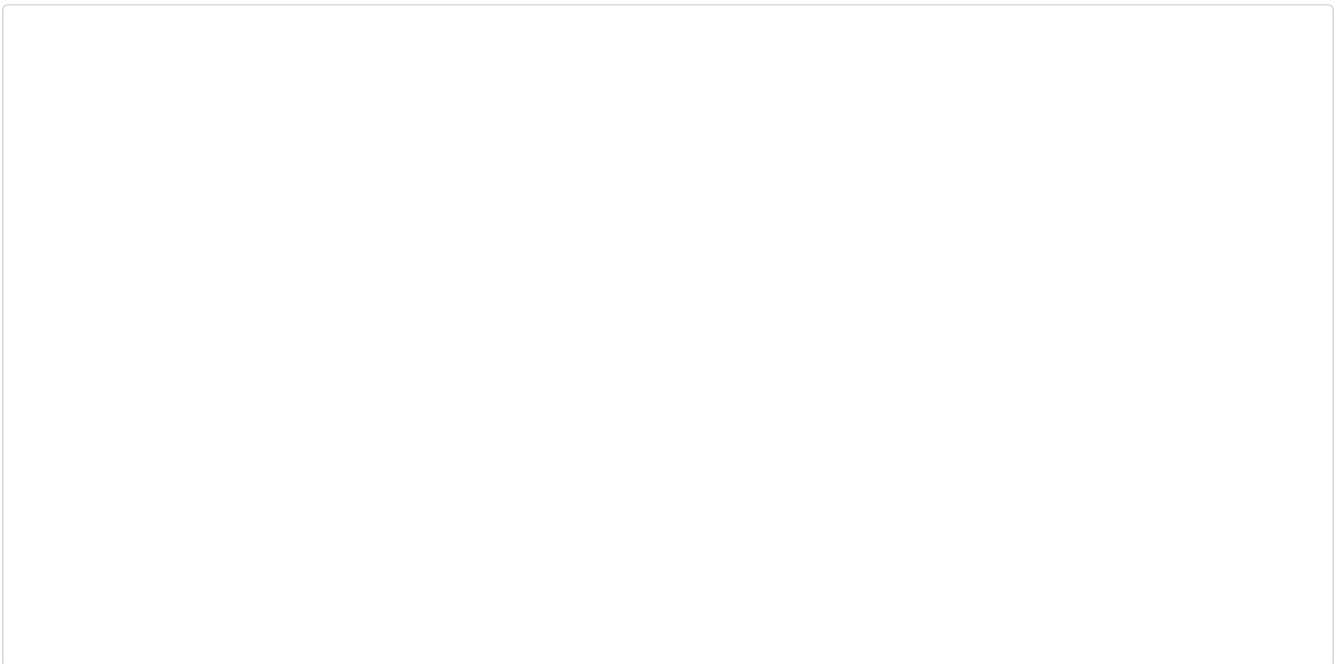


Figure 18. Web Server G) /X™v

Web Server 7 'Connector' e1#\$ Web Server U WAS ~ 2f1 25 /XI Z[ 56. 'Connector' e™v - « 7 WAS List g1 2~ s WAS\* Sd- v )! ' ( Web Server U WAS ~ 2~ { E#a6.

WAS \* Sd- ) ž 3#\$ WAS List g7 '+' LQI R5- v d[ \$ h> 1# /ODW f\$ WAS\* wx - K 'Save' LQI R556. h> 1#\$ LENA Manager 1 • • DWf\$ WAS Node ?A WAS ¢•I V( s t fN° { Â 'Connector' 1 • • 5 WAS\$ Y{ e Í \$6.

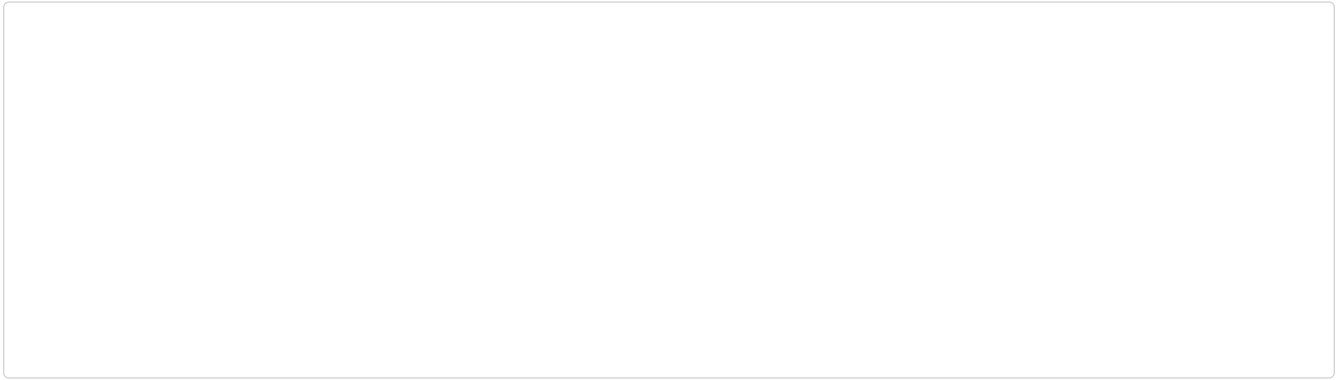


Figure 19. 2~ s WAS Sd

WAS List1 2~ /Xs WASd SdDv Ý[ - « 7 'Save' LQI R5- ÆÎ b , 1 56.

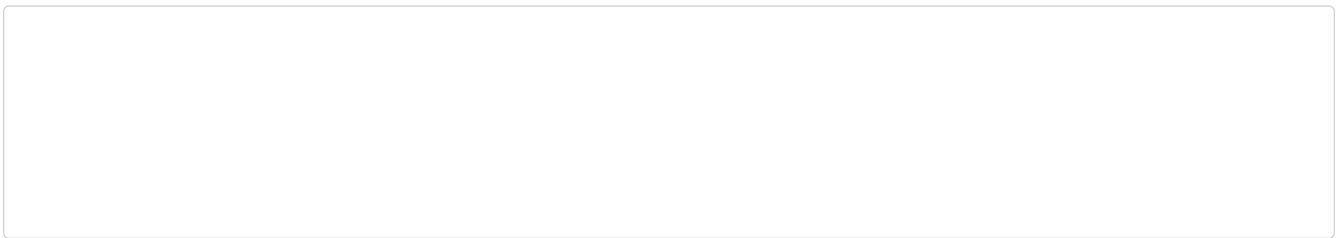


Figure 20. 2~ s WAS d • , 1

### 3.1.6. Session Server ' = E VW

Session Server\$ Session Clustering I ' = Å1 /O- ° 6O U de ² VNA /Os t f 6.

1. Standalone , a : Session Server\* ?@ Server A /O- \$ ² V
2. Embedded , a : Session Server\* ?@ Server A /O- e Í K ) J 1 /O5 WAS < 1 Emebedded  
ÿ%A /O- \$ ² V

Standalone \_\_G ' =T WAS VW

Session Server \$ WAS Node1 /Os t f 6. LENA Manager ^ « 7 'SERVER' §G\* wx ; Session  
Server \* /Os WAS Node\* wx 56. WAS List - « 1 \$ /Oa Session Server\* V( s t f \$  
Session Server List \* V( s t f 6.

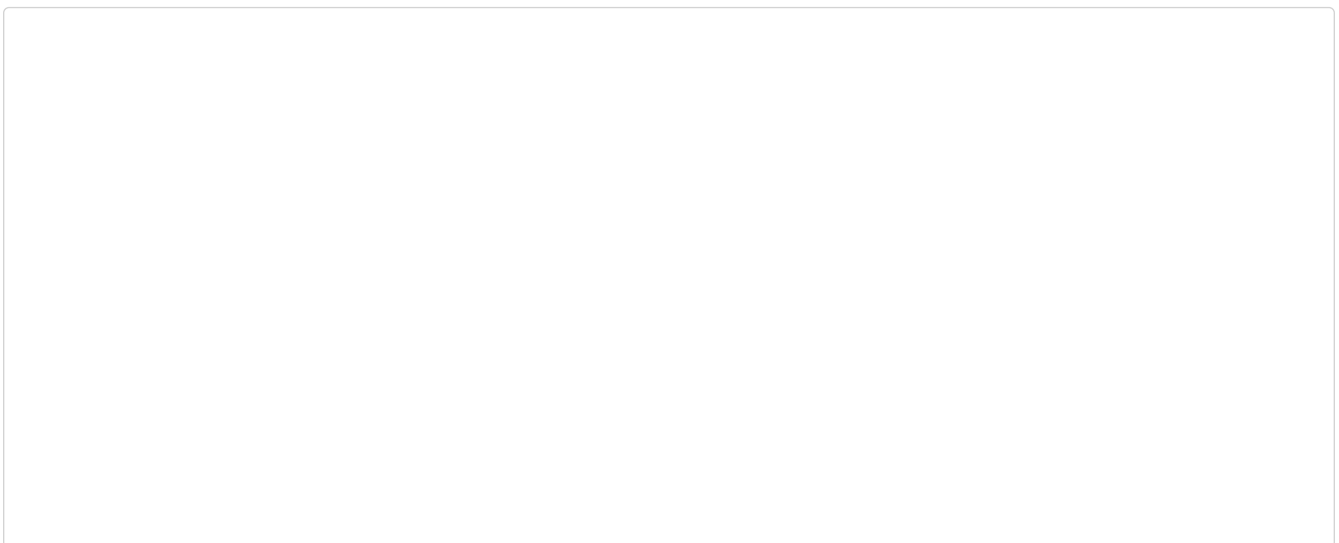


Figure 21. Session Server List V(

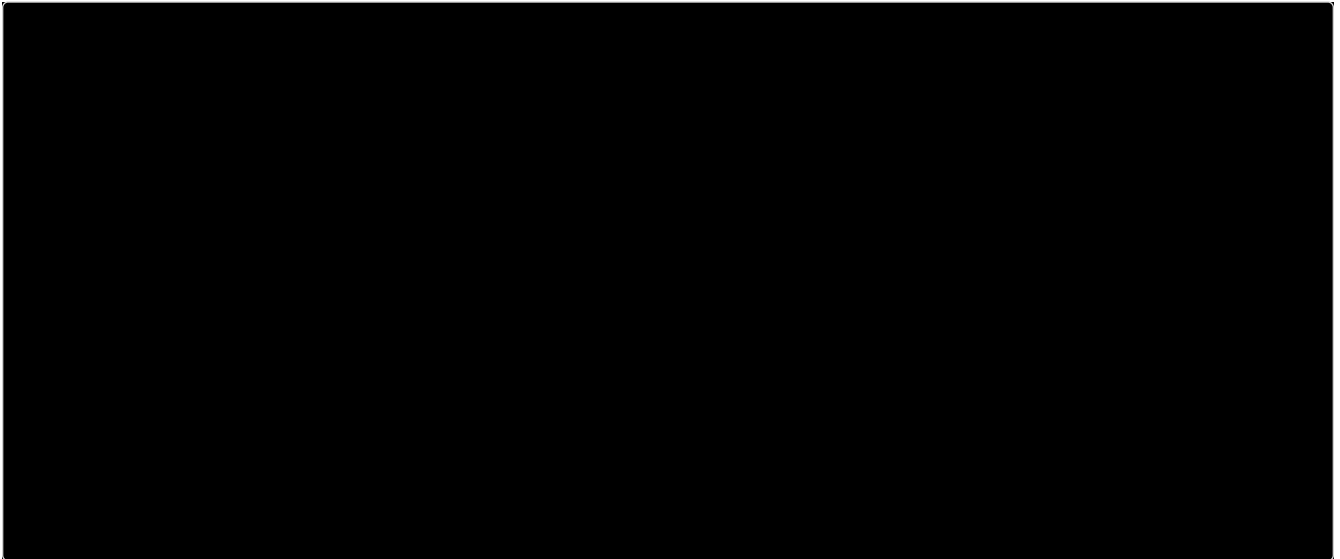


Figure 22. Session Server / OXY P© Popup P P© Å 3 Å

'Install' LQI R5- v Session Server\* /O- ) ž 5 XY\* P©- \$ Popup Y{ \©D° g P©Đ¢> 6OP Q6.

1. Server Type: Standalone (K X)
2. Node: Session Server d / OÈ Node(t X] d)
3. Server ID: LENA Manager d Session Server \* 3 ? - ) ž 5 -T
4. Service Port: Session Server d j =s Port
5. Mirror Server IP: 6î - Æ7 Session Server d / Oa Node(• • 5 Node F 1 # wx)
6. Mirror Server Port: 6î - Æ7 Session Server d / Oa Node1 # Session Server d j = - \$ Port
7. Run User: Session Server ) ~ Å j =s OS7 êX(t X] d)
8. Install Root Path: Session Server d / OÈ ÓA(t X] d)
9. Log Home: Session Server Log ÓA
  - a. default: [Install Root Path]/logs
  - b. custom: j =Ed \_7A ÓA eX

Session Server /O XY\* , U P© 5 . 'Save' LQI R5- v Session Server d /OD° Session Server List 1 # V( s t f 6.



Session Clustering \_` Å Session Server\$ 2) \* /O- Æ - Æ\$ Primary, 6î - Æ\$ Secondary { F™ \_` I 56.

ž 3Å " i 1 # \$ 'Mirror Server IP' 1 6î - Æ7 WAS Node\* eX- j N° 3‡ WAS Node 1 @ hi U Q{ Session Server \* /O56.





Figure 23. 61 - Æ7 Session Server / O

Session Server \* , U / O 5 . WAS U 2~ - ) ž 3 WAS / X ™v 7 'Session' e l wx 56.  
 'Session' e 1 # \$ WAS 7 Session Clustering ' = l ž 5 Session Server 2~ / XI Z [ 56. / X  
 Đ¢ 7 'Session Clustering Enable' Đ¢ I 'Yes' A ÒÓ- Ć • » / X { Ž Å D @ • 56. Client Mode 7  
 ÓÝ ? @ A / O 5 Session Server \* ) ~ - K { \* WAS U 2~ - Ć Session Clustering I ' = - \$  
 2 3 { 6.

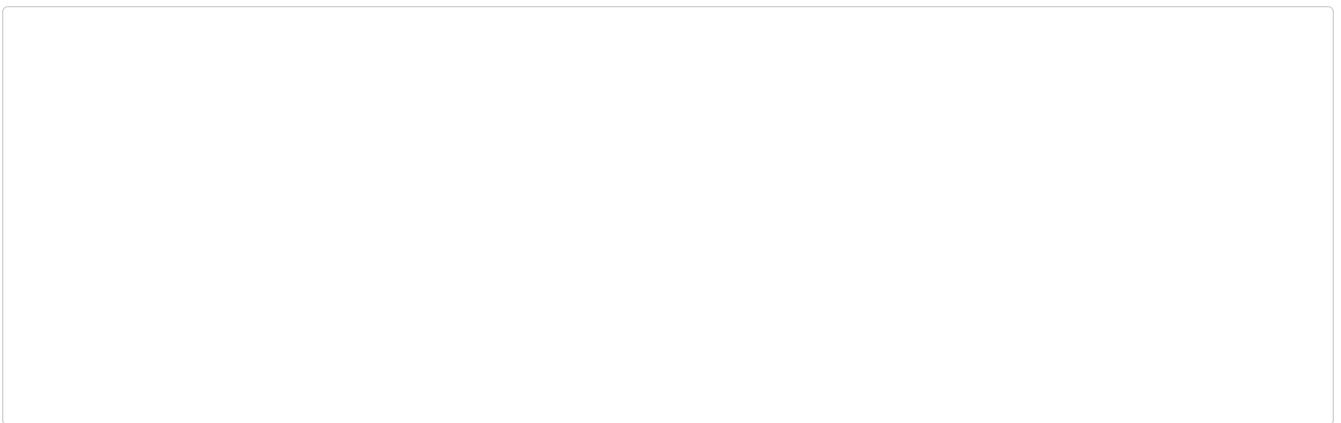


Figure 24. WAS 7 Client , Æ Session Server / X

Client , Æ Session Server \* ) MNA, / X Á > 6OP Q6.

1. Primary Server Host: Primary A e Xs Session Server d / Oa Node \* wx - K Session Server \* e X56.
2. Secondary Server Host: Secondary A e Xs Session Server d / Oa Node U Session Server \* e X56. Session Server d 2) / ODW f K, Primary Server Host \* wx - v ÆCe Session Server d E~ NA Secondary A e Xa 6.
3. External Stored Session: Session Clustering ' = P Sb WAS U Session Server(2) ) 1 # Z [ D\$ Session XY\* Session Server(2) ) 1 # á Z [ s e Ć» \* wx 56. • A Cloud, Container ā Ó 1 # \_` Å 3 ‡ k € I j = 56.(Default false)
4. Share session in applications: WAS1 ĆX Application { ¶ RD\$ ÓÝ 3 ‡ Application ~ Session XY\* C• s e Ć» \* wx 56.(Default false)
5. Multi Login Control: F œ A" ( BW ) : 7 j = Ć» \* wx 56.(Default false)

Client , Æ Session Server 7 ÓÝ / XI ' = s WAS I 6 ž U Q > / XI ' = 3 • Wā 56.



Session / X ÒÓ ; WAS\* K) ~ 3ā 56.

Embedded \_\_G ' =T WAS VW

Session Server 7 ) : I Embedded , <sup>a</sup> A j =s WAS \* wx - Æ / X™vI 2 . , ^ « 7 'Session' eI wx 56.

'Session' e 1 # \$ WAS 7 Session Clustering ' =I ž 5 Session Server 2~ / XI Z [ 56. / X Đ¢ 7 'Session Clustering Enable' Đ¢I 'Yes' A ÒÓ- Æ • » / X{ ž ÅD@• 56. Embedded Mode 7 ÓÝ WAS 1 Session Server ) : { WAS 1 Embedded ý%A WAS d ) ~ 56.

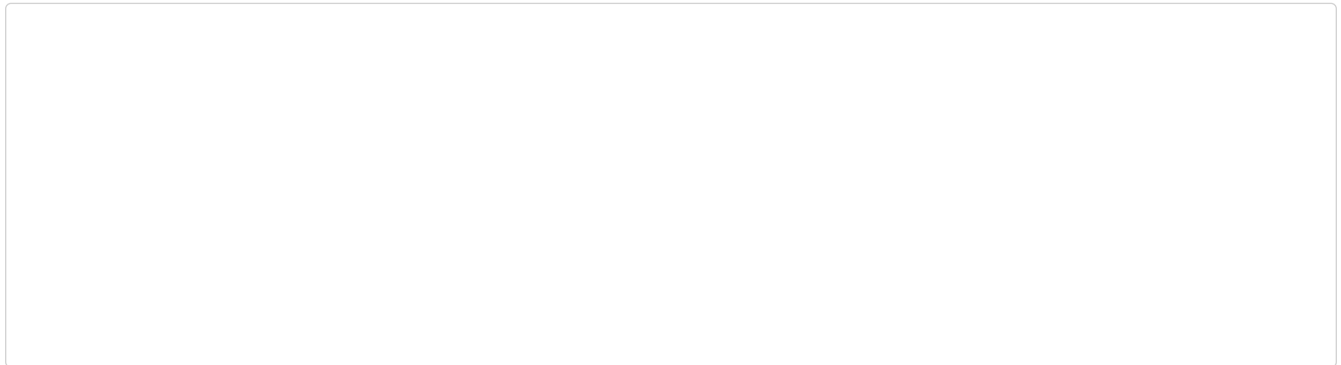


Figure 25. WAS 7 Embedded , <sup>a</sup> Session Server / X

Embedded , <sup>a</sup> Session Server \* ) MNA, / X Á > 6OP Q6.

1. Embedded Host: Embedded Mode wx Å • K WAS A KXa 6.
2. Embedded Port: Embedded Session Server d j =s Port\* P©56.
3. Secondary Server Host: 6î - Æ7 Embedded Session Server \* j =s WAS \* eX56. WAS d / Oa Node \* wx ; WAS \* wx 56.
4. Secondary Server Port: 6î - Æ7 Embedded Session Server d j =s Port \* P©56.
5. Multi Login Contorl: F œ A" ( BW ) : 7 j =Æ» \* wx 56. (Default false)

/ X Á P©, wxI I m . 'Save' LQI nX , 1 - v Embedded Session / X{ E # D° Embedded Session 7 / X> - Æ7 WAS 1# ôu- v 6î - Æ7 WAS 1@ / X{ ' =a 6.



Session / X ÒÓ ; WAS\* K) ~ 3å 56.

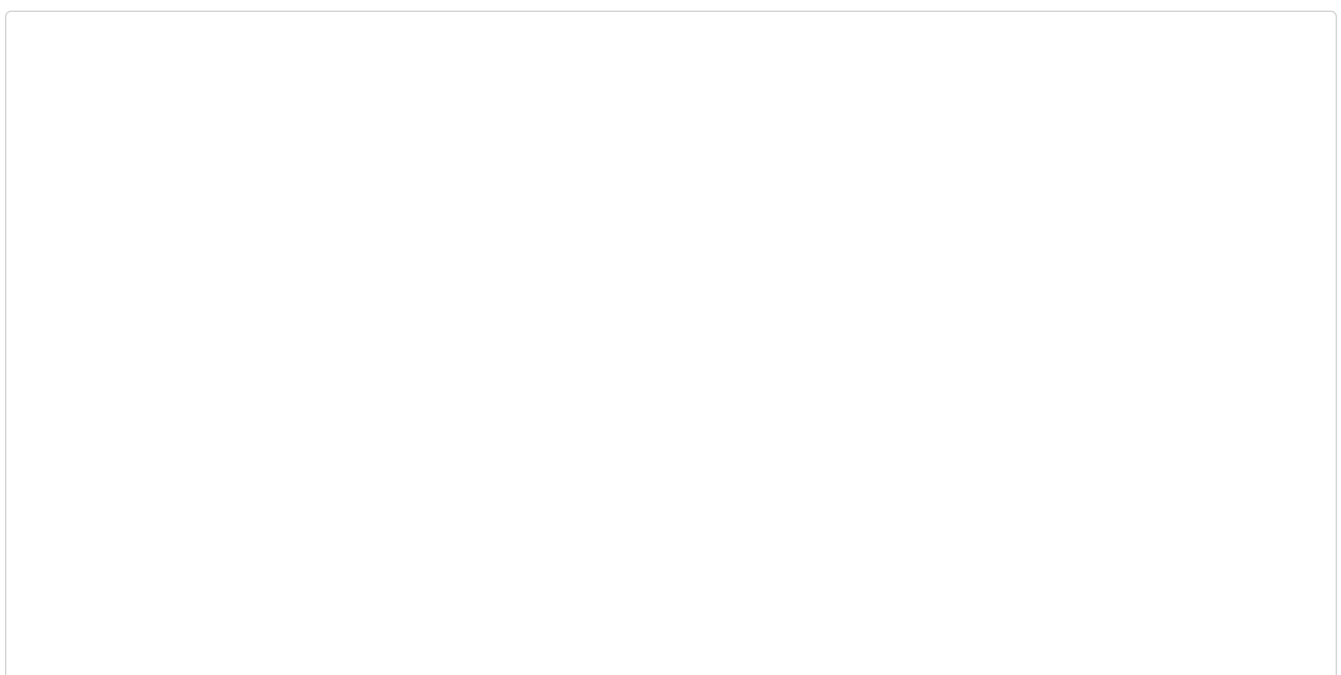


Figure 26. WAS 7 Embedded , <sup>a</sup> Session Server / X 7 E #

### 3.1.7. Server ` VW HI

. # Web Server - WAS 2~ P Session Server / O ; 2~ PXI ] 3# ôu5 2~ /XI V( - \$ ² VI / 56.

LENA Manager 1 # \$ / O5 Server 7 \_` I ~û- \ V( s t f @• Topology View \* BC- K f 6. { Topology ) : I ] 3 2~ { X^' NA V( - \$ ² VP Web Server, WAS / O Å ) ! oKDW f \$ LENA Sample p{ e\* ] 3 2~ { X^' NA DWf \$ e\* V( s t f 6.

Topology a bc HI

LENA Manager ^ « 7 'Topoolgy' § G\* wx 56.

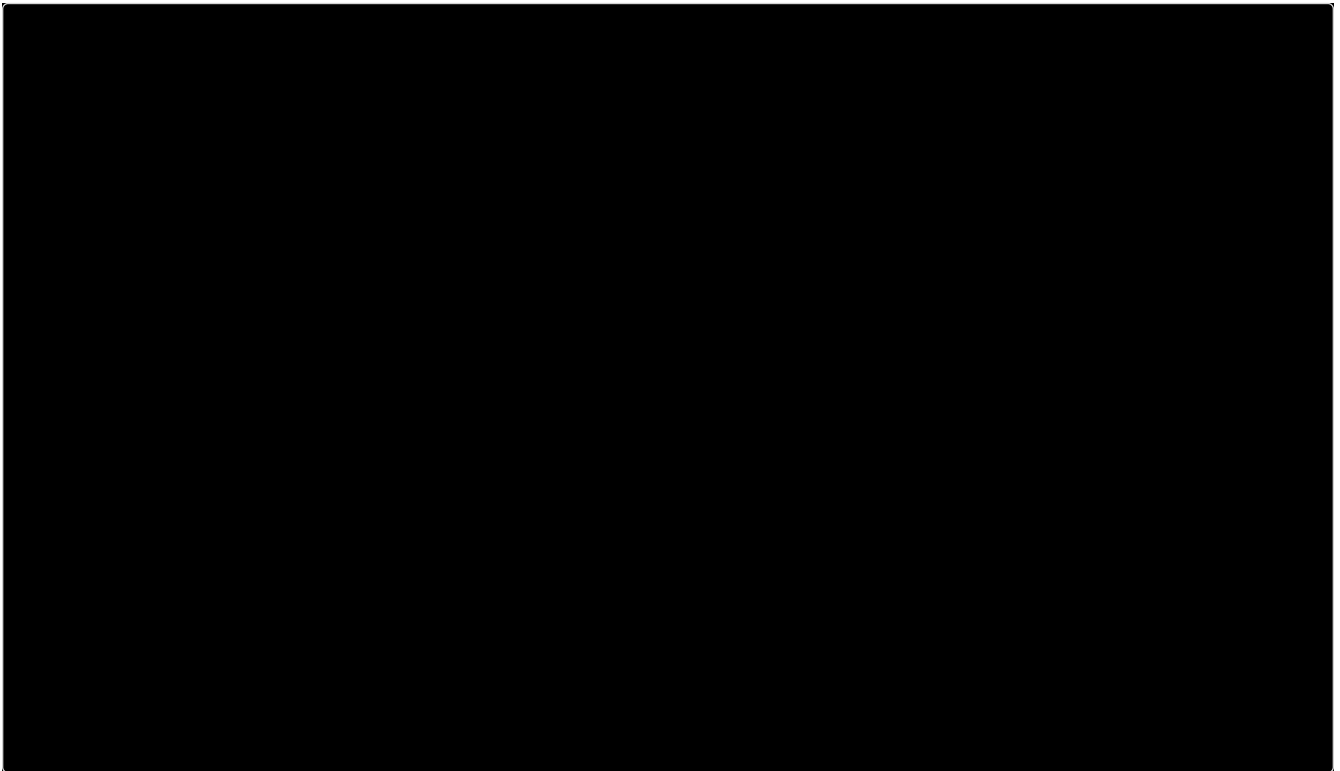


Figure 27. Topology View

Topology View 1 # \$ ) ! ' NA • K • • DW f \$ Node U Node ? / O5 Server 7 \_` P 2~ XY\* V( s t f 6.

Ž " i 1 # \$ Web Server 2) , WAS 2) " [ K Session Server 2) d / ODW f N° Web Server U WAS, WAS U Session Server ~ 2~ / X{ 2f wNA Ž • DK f N° { \* ] 3 Server ~ 2~ { X^' NA Dø\$e V( s t f 6.

Sample Page Sde bc HI

LENA 7 Web Server U WAS 1 \$ ) ! oKa Sample PageU Sample Application { f 6. { \$ G) / O ; X^ 2~ I V( - \$ =@A@j =È t f 6.

q, Web Server 7 IPU Port\* V( 5 . r snŸ, 1 hi U Q{ P©56.

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

" t hi U Q{ LENA 1 # BC- \$ index.html p{ ed - \ D\$ ŨI V( s t f N° Web Server d X^ - \ D\$ ŨI V( s t f 6.



Figure 28. Web Server - \ Test

### Sample Application Sde bc HI

LENA WAS\* /O- v LENA 1# BC- \$ )! Application { oKDW f 6. { Application7 index.jsp, session.jsp \* - \ - v gg WAS - \ uqà, Session Clustering ): uqà\* t us t f 6.

Web Server U WAS d /O G) ^ %A /XDW f 6\$ dX - 1 r snY, 1 hi U Q{ P©56.

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

Web Server U WAS d X^ 2f{ DWf 6v Web Server 7 IPU Port A - \ 5 ž kI > WASA 8®DW index.jsp p{ e\* kI - \ DK 6OP Q{ LENA Sample Application 1 # BC- \$ index.jsp p{ ed - \ a 6.

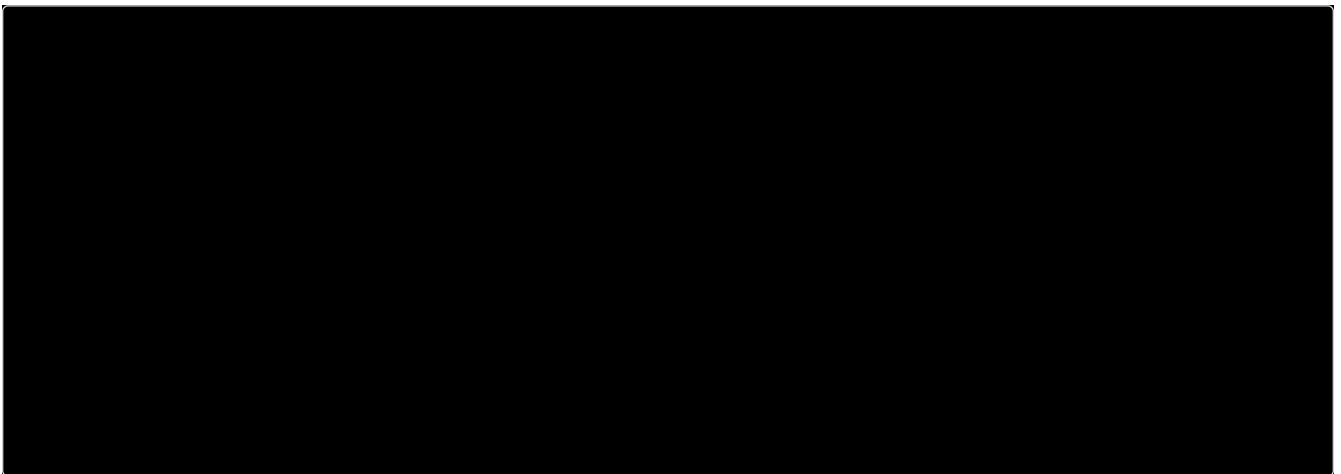


Figure 29. index.jsp - \ Test

index.jsp p{ e\* - \ - v • K kI I Wv WAS d Ö[ - \$e\* Server ID, Service Port, JvmRout ĀI ] 3 V(s t f 6.

{ , 1 \$ ~ %5 Web Server IP, Port A hi U Q{ session.jsp \* - \ 56.

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

session.jsp \* - \ - v • K kI 1 25 Session XYd SdA V( a 6. - \ I &œS1 mn Session Count 7 t d wd- ° U, x - \ » „ αya Session IDd Ž Āa 6. Session Clustering { X^ ' = Dø\$e\* V( - ) ž 3#\$ Session IDd αya ^ %1# • K kI I Ö[ F( WAS \* Fe- K r snY, \* zAK{ - Æ kI I 6Å Y| I ^,) ~ F( 6î WAS d kI I Ö[ - e á Session ID d " 2A • eD° Session Count d wd- \$ ŪNA V(s t f 6.



Figure 30. session.jsp - \ Test