

# User Guide

LENA Support

Version 1.3.1.3

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# Chapter 1. Overview

## 1.1. LENA! " # \$ % & ?

LENA! Web Application" # \$ % & ! ' ( ) \* + , - . ) / O 1 2 3 4 5 6 7 8 9 : ; < = .

LENA! > ? @ A 4 # \$ % B C D & ! Server C E 6 F < B G H @ I J K L & M N \* Web UI M O P Manager Console J < : 8 Q R = . S T U ! Manager Console" G V Server W X Y Z Parameter W [ \ ] C E ^ \_ ` a " b c d e f g e R I h , LENA i P S T U j k @ A U X / U I W I J 4 5 6 7 8 9 : ; S T m n o & p q r S T U s t u v d S T w " x y & z 4 5 6 7 8 K { p | " } ~ e R = .

LENA! ' < Z • Z / € s • , f , m # 4 5 6 7 8 ... † U 6 J Y Z = ‡ ^ P ... † ^ & • B % Š & z = < \* Ē P M • " C D \* = .

## 1.2. LENA ' (

) \* + ' ,

LENA Web Application Server! Ž S WASm \$ V M ` . • , Application Deploy. • P • • " < : ' ' , CPU/Memory a U " S T " • . < • • - ' = .

Opensource - . , / O

LENA Web Server, LENA WAS! Opensource Base J - — 8 ~ ™ \* Opensource Š f . " > œ \* = . Opensource M O I J • . 3 Web Application < ž t P e [ Ÿ < LENA m @ T - J i f Effort B € E ¤ ¥ g e R = . | \* Library \ W [ K { & z § " M © " S T & J Vendor ª « . " V ¬ & z S T U P I T Ownership" - k g e R = .

Multi-Server 1 2 3 Centralized Operation

z ® LENA Web Server LENA WAS B & ° P Cluster J ± " e R 8 Single Operation I J z ® Server B ` ² m C 8 g e R = .

4 5 1 6 7 8 9 : ; < = >

4 5 6 7 8 9 : ; " ... † & M m Ē L \* = < \* Ē P M • " C D \* = . Template M O P ^ 3 & ' u ´ Server W X Server µ C M • " < T & z " & ! - . Set" ¶ r ² ^ . m - ˆ g e R = . Topology View B G V Server + ¹ ^ - . \ \_ ` [ > B \* ° m » A g e R 8 O ² . " • • g e R = . Dashboard B G V ... † ¼ A ² % ½ P . • — ¾ a " » A g e R = . ¿ À m Multi Account K L B G V Ä Ä / U " P Ä Ä Å \* W [ < O • & h , ... † U Action Tracing, W [ Æ , [ > History Ç @ \ Restore M • " C D \* = .

## 1.3. LENA ? , @ A 3 B @ C D

LENA! Binary Package B G V C D < - h ¿ . m ( ) \* + , - . ) / B 1 2 & ' R = . - . ) / ! È d É Ê Ë J ° Ì 8 Í = .

¥ LENAB ... † K L & M N \* Management Module J LENA Manager Console F LENA Node Agent O 1 2 3 = .

¥ > ? @ A Web Service B Î Ĩ & ! Server Module J LENA Web Server, LENA WAS (Web Application Server) B 1 2 3 = .

= Đ r ] - . ) / ž • Ñ W Ò F 2 Ó < m Ô ´ Ē ) Ō Ö " = x = .

### 1.3.1. Management Module

#### LENA Manager

LENA Manager! Web UIB GV LENAP +, U" /M• " W[ \ C8g e Rt Ø WI 3 Web Application<=. LENA Packagem " \$3 %ËÜÚB GV WX \ M` " g e R=. LENA ManagerB GV Server WX/KLB ef &ÜÜ Node Agent \ Advertiser` P \_` " - . VÝ \* =.

=Ðr LENA Managerm# CD&! ¢\$@A M• F ÕÖm ¢V WÒ\* =. ÞBm WÒ–p qr • ÑSà6m ¢V#! ] ÁÃž áÃâ ãT" ä' \* =.

##### ¥ Dashboard

LENA Node, ServerP U" —¾F Event » A

##### ¥ Server

LENA NodeP aØ, ] åæž #çB WX, W[ KL \ M` /¼p C8

##### è System

LENA Node, ServerO KL–! é/ ³ N. &° P System&Nm! z ® NodeB aØg e RI °, &° P Node! z ® Systemm ¼µI J aØg e Ý=.

##### è Node

Node Agent` 1:1J ¢ê–! ÕÖ. Managerm# " ëpm R! Serverm Òì " ef &M NVí Node AgentB GVÝ \* =.

##### ¥ Resource

LENAm# CD&! Module< Þî pi LENA Server` ï Ã&d \_` –! U" m ¢V ÒÑB [ P2I J ð ResourceJ ST\* =. Resource! LENA WASž J Local W[ " g e Rpi , Resource ÁÃB GV Global&d W[ &z WASm# Import&! ñ| " GV ¼µ3 • ò" óg e R=.

##### è Database

DBMSP IP, Port, Driver a ôL@ ÒÑB [ P. &° P DBMS` 1:1J ¢ê3=.

##### è Datasource

DB Connection Pool" LENA WASm# - . &M NV JNDI Name, Url, User ID/Passworda" p[ \* =. &° P Database&Nm z ® DatasourceB - . g e R=.

##### è Application

LENA WASB GV >f g ApplicationP NX` Context PathB p[ \* =.

##### ¥ Topology

LENA Manager• m WX–' \_` - . –8 R! LENA Web Server, LENA WAS aP - . —¾" Topology Diagram æ| I J §—\* =. < M• " GV ServerP ^³ \* WX` M` /¼p C8t O• &=.

##### ¥ Diagnostics

LENA Node` Serverm ¢\* U" +î ZõF ¿m \_I 3 =< \* M• ö÷&ø=.

#### LENA Node Agent

LENA Node Agent! LENA Managerm NodeB aØg ù Node` 1:1J ¢ê–h, LENA Packagem Mú@I J WX–8 R8 " \$3 %ËÜÚB GV M` g e R=. Ě) úgr LENA ManagerB GV Òì \* Node &NP Serverm Òì " üL&! ýF +î Zõ \ • þ' <ZB LENA ManagerJ ; ý&! M• <=. ôL #ç Ĭ 1ÕP Node AgentB WX&! ý< Mú<pi , ( ) m Ôs z ® ÕP Node AgentB - . g e R=. LENA Web Server, LENA WAS! LENA Node &Nm - . –h, LENA Node! &° P System &Nm - . 3=.

### 1.3.2. Server Module

LENA Web Server

LENA Web Server! [ @! " #B i ÿg e RI h LENA WAS Reverse Proxy æpJ \_` &z  
LENA WASO CD&! Web Application # \$ % P front-end ûg" ef \* =. ¿ \$ í % @ I J  
=< \* ÇO M• " <Tg e R! ' , Domain/URI MO &M \ Load Balancing M• F > .  
' <8(SSL)B CD&! ý< ¢§@<=.

LENA WAS (Web Application Server)

LENA WAS! Java Web Application" >f &z Web Application # \$ % B CD\* =. DB  
Connection Pool" <T &M N\* Datasource \_` M• " 1 2&' R=. Java Class ( ) "  
üL &M N\* Servlet EngineF JSP ( ) " üL &M N\* JSP EngineI J i - . - 8 RI h WAR  
TypeP Web Applicationi >f g e R=.



LENA WAS! ãY@I J Advertiser Module" ö÷ &' RI h <! LENA WASP  
JVM ãY +î Z õ ¬F B JMXB GV e%&z LENA ManagerJ i \* \* =.

1.4. LENA E F GH

Managerm a Ø3 Nodem! Node Agent, Application Serverm! AdvertiserO WX– 8 R=.

...† U! ManagerP UIB GV ] Node Agentm Serverm ¢\* C8) +(, : Start, Stop, Reload, Dump,  
W[ Æ„ a)" > ã' , Node AgentO <B e- &z C8B >f \* =.

Node Agent, Advertiser! ĚM@I J +î Z õ ' <ZB ManagerJ i ÿ &' , ...† U! Monitoring  
Dashboard¬ . r ManagerP UIB GV# ] #çP U" —¾" » Ag e R=.



Figure 1. LENA Mechanism

Table 1. LENA - . ) / ž WÒ

? , @A	I J
Manager	AgentB G* ServerC8¬ +î Z õ M• CD
Repository	Manager ...† " N* File/DB ö ÷
Node	Node AgentB ö ÷. Node&Nm Server Module< WX/

? , @A	I J
Node Agent	<div>- Server WX/μC/OX</div> <div>- Server M` /¼p C8</div> <div>- Server W[ KL</div> <div>- Node, Web Server, WAS • p [ &gt;</div> <div>- Node, Web Server U" +î Z õ ' &lt;Z CD</div>
Advertiser	WAS U" +î Z õ ' <Z CD
WAS	Java Web Application # \$% CD
Web Server	WAS~ Reverse Proxy æpJ _` &z Web # \$%P Front-end ûg



# 1.5. => Spec

LENAm# CD-! M• |! %1r ÞB<sup>-</sup> . =.

Table 2. CD M• F %1

; </Spec (LENA-Manager ; K)		= >
Server	Web Server	2
	Web Application Server	2
Resource	Database	2
	DataSource () O)	2
	Application (WAR)	2
Topology		2
Security		2
Diagnostics	Monitoring	2
	Í <sup>3</sup> /¢ê	-
Patch		2

# Chapter 2. Log In/Out

Managerm J ğ AF J ğ P3&! M• " CD\* =.

## 2.1. Log In



Figure 2. Manager Ã« k Ü

J ğ A 4<p &³ 56m! WX3 ğ j <,• 6m! M©p" \_7üOM©–8 R=.

J ğ A ² t², 78 <• P \$ř 8š 9: O ; <&! „ • Vř Ĭ Ĭ Ĭ J J ğ A" g e Ÿ=. <= „ • console" GV O%>, B ?Mk VÝ\* =. (UŇ\* ãTr Appendixm# 'Manager P admin O%>, ?Mk' à@" ä' \* =.)

## 2.2. Log Out

Manager • ³ • 6P **L MNO** " <T&z J ğ P3" g e R=.

## 2.3. Theme PQ

Manager • ³ • 6P **RSTU MNO** ÁÂP Dark Theme ÁÂB GV ABB W[ g e R=. s<Ú +, ¯ =Ë +, É Op ¼m í %< O• &=.

# Chapter 3. Dashboard

Managerm# KL–! ² %½ ž - . [ > , U" +î Z õ, <CÚ, s<•% aP [ > B ) Š&z  
CD\* =.

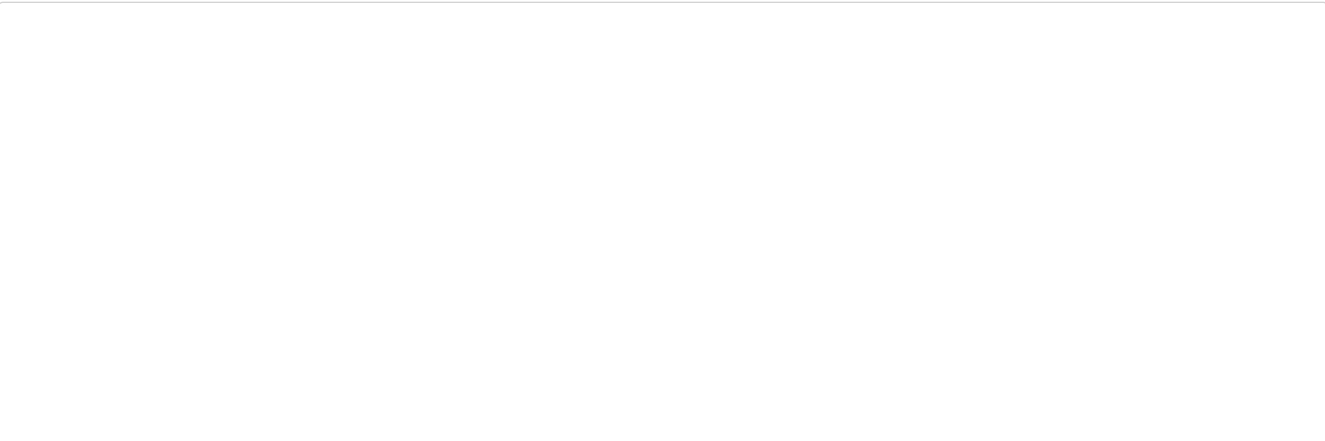


Figure 3. Dashboard

k Ü 56P ² %½ @Øm! J ĵ A \* STUmd Å\* < R! ² %½ @Ø< CD3=. Allr Å\* < R!  
+, ² %½P [ > B GH&z > z `` =.

Table 3. Dashboard à @

VW		I J	X)
INVENTORY	Node	System m 1 2 3 NodeP e	Ê D: NodeP Ž E ž F e  ¥ Web type : Web ServerB WX g e R! ^ , e  ¥ WAS type : WASB WX g e R! ^ , e
	Server	Systemm 1 2 3 Server Ž E ž F e	
	Node Status	Systemm 1 2 3 NodeP U" (CPU, Memory, DISK) ST G • p	Ê D  ¥ High / Middle / Low  ¥ Not working : [ p • pP Node(Agent) F e
	Server Status	Systemm 1 2 3 ServerP U" ST G • p  ¥ Web : CPU, Memory, Thread HÈ  ¥ WAS : Heap Memory, Thread Pool HÈ	Ê D  ¥ High / Middle / Low  ¥ Not working : [ p ! ! Hang • pA # Ç P F e
CHECK	Modified Server	Systemm 1 2 3 Server¼ ÷ M` < ( ) * # Ç I ÷ z Y	
RESOURCE	DB Resource	RESOURCEÁÂm# a Ø– 8 K L– ! Database~ Datasource e	DatasourceP Ê D  ¥ Used : WASm# ST ¼A Datasource e  ¥ Not Used : WASm# 5ST ¼A Datasource e

VW		I J	X)
LICENSE	License Status	<div>^ , 6P s &lt; í % • p (Trial</div> <div>s &lt; í %P å " ) e ¡ !</div> <div>• Ts &lt; í %P å " ) e (ª J ) UM''</div> <div>15) ¡ YZ) §²)</div>	

# Chapter 4. Server

Node \ WAS, Web ServerB KL &M N\* k Ü" CD\* =.

K[ System ã P Node \ ] Serverž ŒeB » A&' , >² ^I J Node \ Server • pB GH@I J KL g e R=.

## 4.1. System

Systemr =eP ServerB Op! LL@A ¿ M<=. "DefaultSystem"" Mú@I J CD&h STU! System" <. , e[ , NC g e R=.

### 4.1.1. WY

System @Ør k Ü 56m ÚL æpJ CD3=.

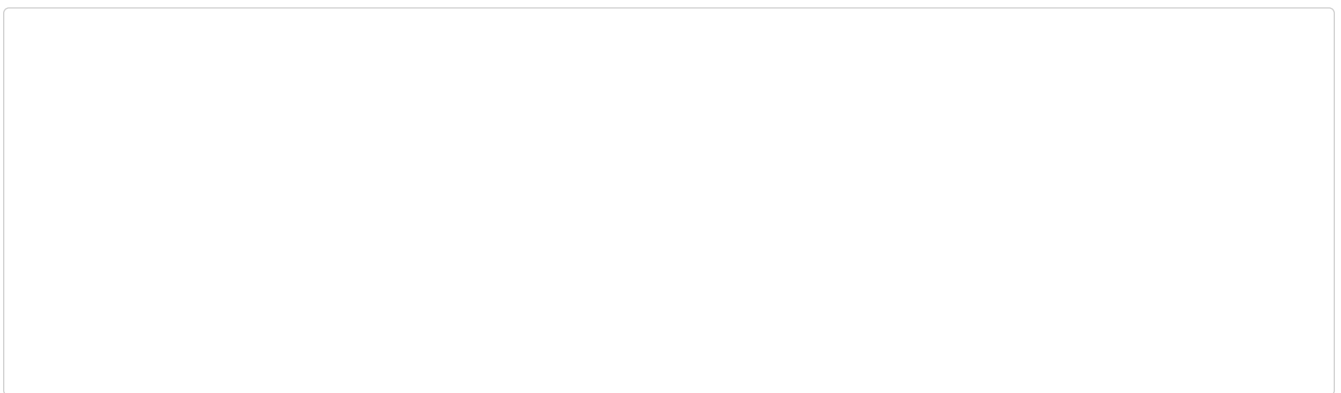


Figure 4. System List

### 4.1.2. ZY

1. ZY(+) [ \ " €O&z @Øm "Create System" " <. \* =.
2. <. g ² %½ Ò" EP\* QRZSBEP\* =.
3. OK [ \ " €O&z Tœ\* =.

!

—÷ J ¿ A\* STUP Å\* < Vİ Systemm áU3=. V, J ¿ A\* STU<sup>-`</sup>) \* Å\* " OÍ STUmdi Vİ System< WX3=. (Node, Server, Resource ` ) &d @T/)

### 4.1.3. R]

1. e[ g System" í %\* =.
2. R] (^\_) [ \ " €O&z í %\* SystemP <Y" Æ„ \* QRZSBEP\* =.
3. OK [ \ " €O&z Tœ\* =.

### 4.1.4. ` =

1. NCg System" í %\* =.
2. ` =(-) [ \ " €O\* =.
3. OK [ \ " €O&z Tœ\* =.



&Nm NodeO I ÷ &! Systemr NCg e Ÿ =. V, Z Systemi NC O• &=.

4.2. Node

Node! =e P WAS, Web ServerB Op! ô L@A Server< =.

4.2.1. WY

Node ListB G&z ] NodeB KLg e R=.

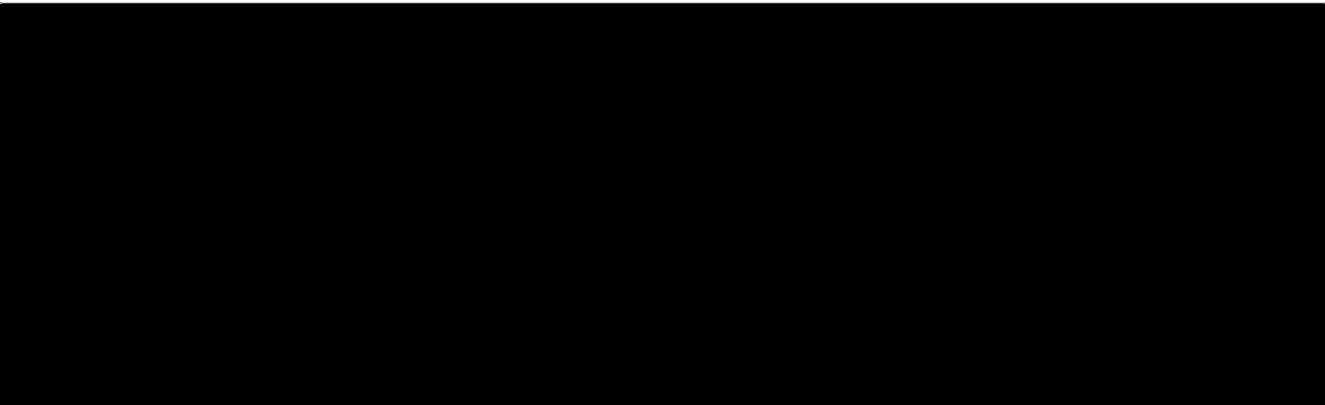


Figure 5. Node List

NodeP « . r ÞB<sup>-</sup> . =.

Table 4. Node « .

VW(*! _Ra)	I J	X)
Status	NodeP —÷ • þ	ÞB <sup>-</sup> . r • þB CD2  ¥ Started(v) ¥ Stop([ )
Name(*)	NodeP < Y	
Type(*)	NodeP Type	=ÐF . r ŽE" CD2  ¥ All: +, <sup>a</sup> : P Server WXO•  ¥ Application: WAS <sup>-</sup> Session Server WXO•  ¥ Web: WEB Server WXO•
Address(*)	NodeP IPĚ /	

VW(*! _Ra)	I J	X)
Port(*)	Node AgentP Port8š	Default : 16800(Node Type< All   ! ApplicationA „ • ), 16900(Node Type< WebA „ • )
Manager Address(*)	Manager IP Ě /	
+ MNO	Register [ \   ! R] (^_) [ \ " €O&z í %3 Node[ > O Æ„ ¼\ " §²	
- MNO	` =(bcd) [ \ " €O&z í %3 Node[ > O NC/ " §²	
	Action(É) [ \ " €O&Ü JAVA Home W[ F Start/Stop" e f g e R! ÁÂ CD	

### 4.2.2. Install

1. Install [ \ " €O&z Node[ > a Ø" `` \$\* =.
2. NodeP « . ] " EP\* =.
3. Save [ \ " €O&z Tœ\* =.

Table 5. Install ² W[ &! « .

VW(*! _Ra)	I J	X)
Node Type	NodeP Type	=ÐF . r ŽE" CD2  ¥ Application: WAS WXO• ¥ Web: WEB Server WXO•
Node Name(*)	NodeP <Y	
Node Address(*)	NodeP IPĚ /	
Node Port(*)	Node AgentP Port8š	Default : 16800(Node Type< All   ! ApplicationA „ • ), 16900(Node Type< WebA „ • )



VW(*! _Ra)	I J	X)
User(*)	Node >f STU I [	Node Type< ApplicationA „ • , root I [ I J >f g e ŸĐ. Node Type< WebA „ • Web ServerP PortB 1024< &B STVŸ&! „ • mi root ST.
Password(*)	Node >f STU I [ \$i 8š	
SSH Port	Vİ Serverm Ā« g SSH 1 Ú	
LENA Home	Node AgentO WX ^ NX	
JAVA Installation	Java WX z Y	
JAVA Home	WX3 JAVA „ J	



Install M• r Linux f „ m#i p“ \* =.

### 4.2.3. Register

1. Register [ \ " €O&z Node[ > B aØ O• \* • pJ Ą „ \* =.
2. NodeP Name, Type, Address, Port, Manager Address(Mú] < CD/) « . " EP\* =.
3. Save [ \ " €O&z Tœ\* =.



¥ Manager IP! NodeP host IPJ U` EP3=.

¥ \_Ú>È - . m Ôs U` EP3 IPO >C \_Ú>È IP` =´ „ • O ; <g e  
R=.

¥ <ù! Manager IPB e[ &z EPVŸ \* =.

### 4.2.4. R]

1. R] (^\_) [ \ " €O&z Node[ > B e[ O• \* • pJ Ą „ \* =.
2. NodeP « . " e[ \* =.
3. Save [ \ " €O&z Tœ\* =.



¥ 1 Ú [ ` <° ñk™ [ ` Ą „ a m PV NodeP Address° PortB Ą „ VŸ &!  
„ • , agent.confP W[ [ > B e[ Q Node AgentB ÷M` \* =.

¥ < ù Ą „ 3 [ > B Managerm# t a e Rt Ø NodeP Address` Port[ > B  
e[ &z EP\* =.

!

e[ 3 [ > B Tœg ù 'Occured Read Timeout' ÁÑpO ; <&Ü ÞBP „ • B  
» A\* =.

¥ Node AgentO Þb = ´ c m# 1 ÚB ST&! „ •

¥ Node AgentO Hang< de „ •

¥ Network f CO R! „ •

#### 4.2.5. ` =

1. **bcd** [ \ " €O&z Node[ > B NC O• \* • pJ Æ„ \* =.

2. **Save** [ \ " €O&z Tœ\* =.

!

Node &Nm ServerO aØ– 8 R! „ • Vİ NodeB NCg e Ỳ =.

!

Uninstallr Linux f„ m#i p” –’ , NCg ^ , B \* Œi í %\* „ • O• &=.

#### 4.2.6. Start

[ p • pA ^ , B M` ² g e R=.

1. Node@Øm# Vİ NodeP h • 6 i j m R! **É** [ \ " í %² CD–! Start ÁÂB í %&Ü  
k òl < ° Žm=.

2. User, Password, SSH Port8š B E P Q **Start** [ \ " ] ´ =.

#### 4.2.7. Stop

M` • pA ^ , B [ p ² g e R=.

1. Node@Øm# Vİ NodeP h • 6 i j m R! **É** [ \ " í %² CD–! Stop ÁÂB í %&Ü  
k òl < ° Žm=.

2. User, Password, SSH Port8š B E P Q **Stop** [ \ " ] ´ =.

#### 4.2.8. Change Java Home

Nodeˉ Nodem WX3 Server6P JAVA Home „ J B e[ g e R=.

1. JAVA Home PathB e[ \* =.

è Node Java Home Path : Node Java Home PathB Ć%\* =.

è Server Java Home Path : í %\* #Ç 6P JAVA Home „ J B Ć%\* =. (Web Nodem#!  
p” &p qĐ)

2. **Save** [ \ " ] ´ =.

### 4.3. WAS

WASB KL&M N\* k Ü" CD\* =. Nodem WX\* ServerP aØ, e[ , NCB ef &h, ¿ \$  
ServerP WX, Cn \ µCB g e R=.

4.3.1. WY

WAS ListB G&z ] WASB KLg e R=.

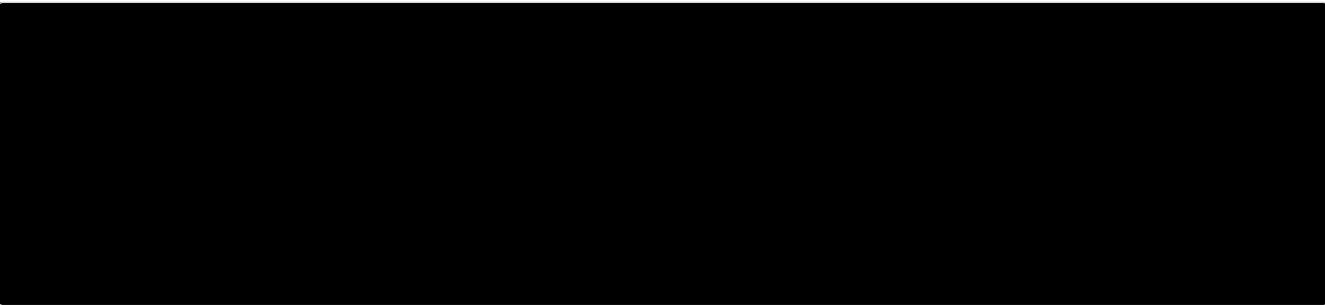


Figure 6. Web Application Server List

WASP « . r ÞB´ . =.

Table 6. WAS « .

VW(*! _Ra)	I J	X)
Status	ServerP • þ	ÞB´ . r • þB CD2  ¥ Started(v) ¥ Stop([ ) ¥ Error(!)
Name(*)	ServerP < Y	
Address	ServerP IPĖ /	
Server ID	ServerP ID	
Type	ServerP å æ	=ÐF . r ŽE" CD2  ¥ Standard ¥ Enterprise/EE ¥ Enterprise/SE
HTTP Port	HTTP 1 Ú8š	
AJP Port	AJP 1 Ú8š	
	ServerP ² • \ ª J	
+ MNO	Register [ \   ! R] (^_) [ \ " €O&z í %3 Å* [ > OÆ„ ¼\ " §²	

VW(*! _Ra)	I J	X)
-MNO	`=(bcd) [ \ " €O&z í %3 Å* [ > O NC/" §²	
	Action(É) [ \ " €O&Ü Forced StopF Forced RestartB e f g e R! ÅÅ CD	

4.3.2. Install

1. Install [ \ " €O&z ServerP WXB `` \$\* =.
2. Server Type, Server ID a" EP\* =.
3. Save [ \ " €O&z Tœ\* =.



¥ Nodem >C WX–8 R! Server` Managerm# KL&! ServerP [ > m!  
o<O R" e R=. (consoleMO WX ²)

¥ Server ID ¼µ 9: O ; <&! „ • , Register M• " <T&z WX3 Server [ > B  
ÇOJ »AVÝ \* =.

4.3.3. Clone

1. Clone [ \ " €O&z ServerP µCB `` \$\* =.
2. Node Listm# µCg ServerB í %\* =. <ù Clone Server ID, Clone Service PortO U` I J  
EP3=.
3. Clone Server ID` Service PortB " &! ] I J e[ \* =.

(Include External Source! =´ ^, J #çB µC&! „ • STO• &h, µCg #çm p1–8  
R! 8qLr<; ( ) t 2Ó µC&! p zYBW[ \* =.)

4. Save [ \ " €O&z Tœ\* =.



¥ Nodem >C WX–8 R! Server` Managerm# KL&! ServerP [ > m!  
o<O R" e R=. (consoleMO WX ²)

¥ Server ID ¼µ 9: O ; <&! „ • , register M• " <T&z MI m WX3 Server  
[ > B ÇOJ »AVÝ \* =.

4.3.4. Register

1. Register [ \ " €O\* =.
2. aØ&Û! ServerB í %\* =.
3. Save [ \ " €O&z Tœ\* =.



System > Application Server List Tabm# t WXO O• &=. ³ , Node Listm# WXg  
NodeB í %VÝ \* =.

### 4.3.5. R]

1. **R]** (^\_) [ \ " €O&z Server[ > B e[ O• \* • pJ Æ„ \* =.
2. ServerP « . " e[ \* =.
3. **Save** [ \ " €O&z Tœ\* =.

### 4.3.6. ` =

1. **` =**(bcd) [ \ " €O&z Server [ > B NC O• \* • pJ Æ„ \* =.
  2. **Save** [ \ " €O\* =.
  3. **OK** [ \ " ] vÜ NC åæ" í %&! I < ~P3=.
- è Unregister : Manager DBm#i VÍ Server [ > B NC&' ôL@A Server enginer å p (ÇQ  
**Register** [ \ " GV =² aØ O• )
- è Uninstall : Manager DBm# VÍ Server [ > B NC&' ôL@A Server enginet NC
4. Uninstall í %² ,J ç s t u L NCz YB v! I < ~P3=.



WASB NCg „ • # \$ % C8(ADMIN > Security > Rule Applying ÁÃ)P @T ¢•  
 @Øm# VÍ Server! NC3=.



ADMIN > Preference > Manager Environment ÁÃP Manager Configuration  
 † Üm# use Server Delete Protection ] " trueJ W[ &! „ • Managerm# #ÇO  
 uninstall–! ý" ñp g e R=.

### 4.3.7. Start/Stop

#### Single Start/Stop

1. **Stop** [ \ " €O&z ServerBª J \* =.
2. **Start** [ \ " €O&z ServerB² • \* =.



¥ ServerB¼p² WAS O # \$ %¼A +, • ò< wm Qª J 3=.

¥ **General** xP Shutdown Timeout ² ^ <Qmt • ò< w° p q r „ • - CJ  
 ¼p3=.



ServerB² • &Ü J ç ( ) " y e R! k ò< >f 3=, k ò" GV ServerP [ •  
 M` z YB » Ag e R=.



² • O• \* • p) „ • mi **Start** [ \ < z . k 3=.

#### Multi Start/Stop

1. ² • { rª J &' U &! µeÕP ServerB í %\* =.
2. Server @Ø &³ P **Multi Action** [ \ " €O\* =.
3. k òI m# Action Type" í % Q **Action** [ \ " €O&z µeÕP Serverm ¢\* ² • { rª J  
 • ò" e f \* =.

!

k ò k Üm# Start / Stop Òì <Qm! k ò" | } s t ) + \* Òì < ¼p– p q! =.

Forced Stop/Restart

1. Server @Ø Oœ • 6P ef ; <(É) [ \ " €O\* =.
2. - C ª J { r - C ÷² • " ef \* =.

!

- C ¼p, ÷² • " ef &Ü —÷ # \$ %¼A +, • ò< V² ¼p– J ĚPVÝ\* =.

4.3.8. I ] ] / 1 2

ServerP W[ [ > B Æ„ &! M• " CD\* =. Server @Øm# Æ„ &Û! Server Ò" í %\* =. Standard EditionP „ • General, Session, Logging, Web Config, Environment, Properties, Config Tree, Historyx " CD&h, W[ [ > e[ ² ~ò" &z µ" < O• &=.

!

Server W[ " Æ„ g „ • e[ 3 SàP O†" N&z ServerP ÷M` < ( ) &=

General

ServerP ) O@A W[ [ > B KL \* =. Port[ > , Connector[ > , Stuck Thread K{ W[ " e[ \ Tœ g e R=.

W[ [ > P • ÑãTr Þßˉ . =.

1. Server Info

ServerP Ě) W[ ] " ° Ž• =.

Table 7. Ě) W[

VW(*! _Ra)	I J	X)
HTTP Port(*)	HTTP 1 Ú8š	
AJP Port	AJP 1 Ú8š	HTTP 1 Ú8š - 71 (U` I €)
HTTPS Port	HTTPS 1 Ú8š	HTTP 1 Ú8š + 363 (U` I €)
Shutdown Port	Shutdown Òì f U• " , M N* 1 Ú	HTTP 1 Ú8š - 75 (U` I €)
Install Path	Server WX „ J	
Java Home Path	Java Home „ J	
Minimum Heap Size(m)(*)	WASm W[ g é / Heap S < f (Megabyte)	Default : 512
Maximum Heap Size(m)(*)	WASm W[ g é ¢ Heap S < f (Megabyte)	Default : 512

VW(*! _Ra)	I J	X)
Application Base	ApplicationP Base s t u L	ServerO stop • p < n ° , appBasem deploy < 3 Application < Ÿ " „ • mi e [ < O • & = .
JvmRoute	ServerP Unique* Identifier	System Property m W[ - 8 R! ] " • í 2.  Ÿ " „ • server.xmlP ] " ST  (Hostname + PortP WHI J < . /)
Auto Deploy	8qLr < ; Æ „ ² U` Deploy z Y	Default : false  Applicationž DocBasem war ( ) " ÷ ò J , g „ • ¥ p /
Deploy On Startup	WAS M` ² Application Deploy z Y	Default : true
Shutdown Timeout	Server <sup>a</sup> J ² > f ¼ A • ò < I ÷ g „ • Φ M & ! ² ^ ( ? )	Default : 86400

## 2. Connector

Serverm# ST & ! Connector W[ ] " ° Ž • = .

Table 8. Ė ) W[

VW(*! _Ra)	I J	; ga
Protocol Type	„ J u ... å æ	HTTP/1.1, AJP/1.3
port	1 Ú 8 š	
redirect Port	Redirect 1 Ú	HTTPS Port <sup>-`</sup> )
connection Timeout	† ‡ ; Ž \ P 3 (ms)	HTTP : 20000, AJP : 60000
URIEncoding	URI byteB Æ f & M N* Character Encoding	UTF-8
server	Http Response m Φ * Server HeaderB ÷ [ P & z Server [ > ^ ~ " ñ p	Server
maxThreads	ConnectorO < . g e R! é Φ Thread e	256
minSpareThreads	Connector < . ² » > & ! é / Thread e	10

VW(*! _Ra)	I J	; ga
maxQueueSize	Request Queue P é ¢ ^ <	Integer.MAX_VALUE
packetSize	AJP packet È M	8192
enableLookups	DNS LookUp ST z Y. ST &p q" ² . • m å L &=	false
compression	HTTP message Body %¸, z Y (off, on:Texti , force;j H)	off
tcpNoDelay	TCP OŠ" Delay Ý < j ý	true

3. Stuck Thread

Stuck ThreadP W[ ] " ° Ž • =.

Table 9. È ) W[

VW(*! _Ra)	I J	X)
Threshold(s)	Stuck ThreadB   Ž &M N* é / ² ^ (s)	
Interrupt Thread Threshold	Stuck ThreadB ¼³ &M N* é / ² ^ (s)	Stuck Thread < Ž < Q n? Æ ª J ² SÛÜ "Threshold+n"] EP

4. Service Point

Endpoint AddressP W[ ] " ° Ž • =.

Table 10. È ) W[

VW(*! _Ra)	I J	X)
Endpoint Address	WASP ¢§ # \$% ¢ ÁA È /	

Logging

ServerP Logging W[ [ > B KL \* =.

1. Log Home

Table 11. È ) W[

VW(*! _Ra)	I J	X)
Log Home(*)	Log Home „ J	default í %² #ÇWXstuL &N logs • } J W[ , custom í %² Log Home Prefixà @m# J¿stuL Ž „ J EPO•
Retention Days(*)	J¿ é ¢ > K ) e	Default : 0(• C*)

2. Access Log



Requestm  $\Phi^*$  Access J  $\zeta$  P W[ ] "  $\circ$   $\tilde{Z} \bullet =$ .

Table 12.  $\tilde{E}$ ) W[

VW(*! _Ra)	I J	X)
Directory	Log s t u L	$\alpha \Phi, J \mid !$ \$CATALINA_BASEP $\bullet \Phi, J J p[ g e$ R $\partial$
Pattern	Logging fieldP Layout	
Prefix	Log ( ) P prefix	
Suffix	Log ( ) P suffix	

### 3. Handler

Handler W[ [  $\succ$  P  $\bullet$   $\tilde{N} \tilde{a} T r$   $\mathfrak{P} \beta^-$  . =.

Table 13.  $\tilde{E}$ ) W[

VW(*! _Ra)	I J	X)
Name(*)	HandlerP $\in \beta \% \tilde{O}$	
Type	HandlerP $\mathfrak{A} \mathfrak{a} \mathfrak{e}$	ConsoleHandler $\bar{\phantom{x}}$ FileHandler $\acute{\phantom{x}}$ % O $\bullet$
Level	HandlerP J $\zeta$ ' $\bullet$	
Filter	java.util.logging.FilterP - $\text{—}H$	
Formatter	java.util.logging.FormatterP - $\text{—}H$	Default java.util.logging.SimpleF ormatter
Encoding	HandlerP Character Encoding	
Root	Root Loggerz Y	

### 4. Logger

Logger W[ [  $\succ$  P  $\bullet$   $\tilde{N} \tilde{a} T r$   $\mathfrak{P} \beta^-$  . =.

Table 14.  $\tilde{E}$ ) W[

VW(*! _Ra)	I J	X)
Name(*)	Logger < Y p[	
Level(*)	LoggerP J $\zeta$ ' $\bullet$	
Handler(*)	LoggerO $\mathfrak{S}'$ * HandlerB ST g p $\acute{\phantom{x}}$ %	ConsoleHandlerO M $\acute{\phantom{x}}$ $\acute{\phantom{x}}$ %



ServerP  $\mathfrak{J} \zeta$  W[  $( ) r$   
\$CATALINA\_HOME(\$CATALINA\_BASE)/conf/logging.properties < =.

## Web Config

Global web.xml P W[ " KL&! kÜ" CD\* =. ( ) à@" e[ \* Q Save [ \ " €O&z Tœ\* =.

W[ [ > P • ÑãTr ÞB<sup>-</sup> . =.

### 1. Default Servlet

Table 15. É) W[

VW(*! _Ra)	I J	; ga
Listings	Welcome( ) < Ÿ" ù, Directory Listing" ' Tgp z Y	false
Input	Input buffer size in bytes	2048
Output	Output buffer size in bytes	2048
Readonly	PUT, DELETE a P HTTPÁ/, B ' T&p qĐ	true
FileEncoding	File Encoding	platform default
ShowServerInfo	Directory Listing< ' T– 8 R" ù Server [ > B §² gp z Y	true
LoadOnStartup	WAS M` ² Servlet J " " # p[	1 (Đe: disable / 0: Oœ Bp• )

### 2. JSP Engine

Table 16. É) W[

VW(*! _Ra)	I J	; ga
CheckInterval	DevelopmentO false) ù jspP Æ„ " – S&z ÷—( ) gp » A&! ĚM(s)	0 (0: \$z . k / < e: Vİ ĚMJ z . k)
Development	Development z Y. DevelopmentO trueA „ • m! modificationTestInterval ] " ĚMJ &z Æ„ " – S 2	true (0: á accessB= ~ –)
GenStringAsCharArray	String< . " Char ArrayJ gp z Y	false
ModificationTestInterval	DevelopmentO true) „ • m` • &! jsp Æ„ – S ĚM	4
TrimSpaces	ê™m# š' Ÿ! whitespaceB Cn&z ê™> < ÚB œ\	false
JavaEncoding	Java/ %B generategù P Encoding	UTF8
LoadOnStartup	WAS M` ² Servlet J " " # p[	3

### 3. JSP Page Encoding

Table 17. É) W[

VW(*! _Ra)	I J	X)
URL Pattern	Page Encoding" @T g JSP PageP URL Pattern	
Page Encoding	@T g Page Encoding" p [	

4. Session

Table 18. Ė) W[

VW(*! _Ra)	I J	X)
SessionTimeout	Ń; Ž \ P 3 ² ^ (&)	Default : 30

5. Welcome File List

Table 19. Ė) W[

VW(*! _Ra)	I J	X)
File(*)	Directory indexJ š ~ g „ • m serviceg ( ) " " # ĆJ p [ 2	

Environment

JVM • ; , Start ShellP W[ F System Properties(Enterprise EditionA „ • i CD)B KL&! k Ü" CD\* =. ( ) msZ B GV e [ \* Q Save [ \ " €O&z T œ\* =.

- ¥ JVM Setting (\$CATALINA\_HOME/bin/setenv.sh): Server >f " N\* JVM • ;
- ¥ Custom Settings (\$CATALINA\_HOME/bin/customenv.sh): ST U † %Ž f „ Æe W[
- ¥ Start Shell (\$CATALINA\_HOME/env.sh): Server ² • " N\* Shell Script



JVM\_ROUTE ] r z M# Ÿ Ą e [ & p q' , General xP Server Info † ū m R!  
JvmRoute à@P hi j ; [ \ " ST&z e [ \* =. z M# Ÿ Ą e [ g „ •  
Manager DBP [ > O Update– p qP DB] ) XO ; < \* =.

- ¥ Catalina.properties (\$CATALINA\_HOME/conf/catalina.properties): ServerP Catalina W[



\$CATALINA\_HOMEr WASP Mú WX s t u L < =. \$CATALINA\_BASE! ú ß & ° P  
WASm µ e Ō P InstanceB ST&' U g ù s t u L B < . & z Instancež J  
p [ & z ST– pi LENAm#! WAS InstanceO 1:1 KI s \$CATALINA\_HOME<  
i \$CATALINA\_BASEJ ST 3 =.



Mú@I J W[ " e [ g e Ÿ t Ø Disable – 8 R pi , e [ & ' Ć r „ • ADMIN >  
Manager Environment > Manager Configuration à@m# i ] [ \ " €OV P B  
W[ " false J Æ „ \* =.

```
server. envi ronment. envshel l . readonl y=fal se
```

Properties

ServerP System Properties ~ System EnvironmentsB » A&! k Ü" CD\* =. System Properties ¼  
Key Properties B ž t J CD&z Server „ J , JAVAç i a P Ė) [ > B » Ag e R =. ServerO

M` 3 • pm#i [ > B » Ag e R=.

## Config Tree

WASP WX„ J &NP /conf • } &N W[ ( ) 6" ( ) Œ%MB GV KL g e R=.

!

Node AgentB >f &! STUO WAS W[ [ > ( ) P ÄÄ Å\* < R8Ý e[ < O• &=. ÄÄ Å\* < Ý" „ • ( ) Write Å\* < Ý8 Œ%g e Ý=! Å² pO ~P 3=.

## History

W[ [ > P ~ð \ μ" M• " CD\* =. W[ [ > B e[ &z Tœ&Ü åæž J HistoryB KL \* =. e[ ) ² ~ W[ ( ) Type" EP&z –É\* =.

/; (k /; ) [ \ " €O&z í %\* ( ) P [ > B y e RI h, Restore [ \ " €O&z Vİ W[ ( ) J μ" g e R=.

## 4.3.9. Resource 1 2

ServerÁÂ &NP ResourcesÁÂB í %&Ü Vİ Serverm K{ 3 Resource[ > B KLg e R! k Ü< §² 3=. Mú@I J DataSource Resourcem Φ\* [ > B KLg e R=.

!

WASm Resource B W[ &! ñwr =ĐF . =.

¥ ÇO : New [ \ " €O&z ResourceB ÇO\* =.

¥ NC : Delete [ \ " €O&z ResourceB NC\* =.

¥ OQ9M : Import [ \ " €O&z RESOURCE ÁÂm# aØ3 ResourceB OQᄡ=.

## DataSource

WASP Application< STg e R! JNDI DataSourceB KL&! M• " CD\* =. JNDIB W[ &z Serverm# >f –! +, Application< Dâ &z STg e RI h, ] ] P Applicationm JNDI W[ " &z STg et R=.

Server DataSource W[

Serverm# >f –! +, Application< Dâ &! DataSourceB W[ \* =. Serverm# ST O• \* DataSourceP @Ø" WXg e RI h, DataSourceP aØ, e[ , NCO O• &=.

DataSourceP • pB HÈ&MN\* Ä« A%Út ef g e R=.

DataSourceP «. r ÞB⁻ . =. é? kÜm# > <p q! «. r Expand all [ \ " €O&Ü §² 3=.

Table 20. DataSource «.

VW(*! _Ra)	I J	X)
Scope(*)	DataSourceB STg ÊN	<p>=ĐF . r %¥„ B CD2</p> <p>¥ Context: + , Application&lt; Dâ &amp;t Ø Datasource [ &gt; O DG context † ûm W[ 3=.</p> <p>¥ Global: GlobalNamingResource† ûm Datasource [ &gt; O W[ - ' , 8qLr &lt;; Ōž @I J DataSource Link Listm# W[ &amp;z ST * =.</p> <p>¥ Global+ResourceLink: GlobalNamingResource † ûm Datasource[ &gt; O W[ - ' Datasource ōÈ! DG context† ûm W[ 3=.</p>
JNDI Name(*)	Global DataSourceP JNDIÒ	
Databases	DGI J STg ' <Z / %P [ > B W[	
Resource Name	DatabasesP <Y	
Address(Host/Port)	DGI J STg P<óˆ 1 Ú	
DriverClassName	JDBC Driver €B%Ò	
URL(*)	JDBC URL	
Username(*)	Ã« STUÒ	
Password(*)	Ã« O%> ,	<p>encryption" HÈg „ • O%&gt; , B   š k &amp;z Tœ* =. &gt; . " NV   š k &amp;! ý" Åœ* =.</p>
Encryption Level	AS [ > m Φ*   š k ÊN p[	Default : Password only
DefaultAutoCommit	Poolm# <. 3 Connection6P U` Commit • p	Default : JDBC driverP Mú]

VW(*! _Ra)	I J	X)
AutoReconnection	TestOnBorrow TestOnWhileIdleP ] " W[ g Û ST.  true/false m Ôs É ] t ` ) &d W[ /.  User Defined í %² É ] " STUO ÿ Ã W[ O•	
InitialSize	PoolP ? M Connection e	Default : 10
MaxActive	PoolP é ¢ Connection e	Default : 100
MinIdle	é / Idle Connection e	Default : 10
MaxIdle	é ¢ Idle Connection e	Default : 100
MaxWait	Poolm OT * Connection< ÿ" „ • ¢M&! é ¢² ^ (ms)	Default : 30000
MinEvictableIdleTimeMi llis	Vĩ ² ^ <• idle • pJ Poolm I ÷ * Connectionr Cn ¢• < / (ms)	Default : 60000 (60s)  (XaDataSource = trueJ W[ &Ø" ² 1800000 (30m))
ValidationQuery	Connection å " . – § " L	Default : null
ValidationInterval	Connection å " . – § Ě M(ms)	Default : 3000
TestOnBorrow	Poolm# † ‡; " ©ã M ; m validationQuerym W[ 3 " L f" ef &z † ‡; P å" z Y » A	Default : default
TestOnReturn	Poolm † ‡; " Oª &M ; m validationQuerym W[ 3 " L f" ef &z † ‡; P å" z Y » A	Default : default
TestWhileIdle	Idle • pP † ‡; m ¢V validationQuerym W[ 3 " L f" ef &z † ‡; P å" z Y » A	Default : default
LogValidationErrors	validation query ef Q 9: ; < ² 9: ~P z Y	Default : default(false)
TimeBetweenEvictionR unsMillis	ST–p q r Connection" Ç~&! Thread >f Ě M(ms)	Default : 5000
RemoveAbandoned	Connection å > – ~ z Y	Default : default
RemoveAbandonedTim eout	å >Connection" < ³ &M N* Timeout ] (s)	Default : 60
LogAbandoned	Connection å > Û L² J « z Y	Default : default
AbandonWhenPercenta geFull	Connection pool< W[ * ~ å• " ? F V Ÿ pi abandon" ef 2	Default : 0

VW(*! _Ra)	I J	X)
JdbcInterceptors	å_&' q®¿ O• * AZ¬ZB ST&z STU [ P M• " ÇOg e RÐ	QueryTimeout W[ ² QueryTimeoutIntercept or(queryTimeout=² ^( ?)) EP

!

Default ] < true | ! falseO Þb default A „ • , JDBC DriverP Mú] < ST 3=.

!

¥ DataSourceB Context ÊNJ W[ &Ü +, Application< Dâ \* =.

¥ Password | Šk a' L - r AESB ST&' R=. | Šk B N\* S ] r Manager  
LENA Home &N /conf/repository/manager.conf ( ) F ] WAS Home &N  
/conf/advertiser.conf ã m# 0datasource.key=S] 0I J KL \* =.

## 2. Databases

URL W[ ² DG" STg [ > B DatabasesB i 68 aØ\* =.

ef (+) [ \ " €O&Ü k òI < <. 3=.

- DatabasesB - &g Resource Name" EP\* =.
- U` I J ®>Í DriverClassName " » A\* =.Æ„ g ( ) O R" „ • Æ„ \* =.
- Address(P<ó \ 1 Ú)B EP\* Q Tæ\* =.

## 3. JDBC driver Upload

ManagerB GV JDBC Driver libraryB upload g e R=.

DataSource • Ñ [ > &NP Upload [ \ " €O&Ü ÞB⁻ . < uploadB N\* k Ü< ~P3=.

- SearchÇ⁻ " GV upload g ( ) " í %\* =. Upload g ( ) r JDBC Driver library < J JAR  
æ| P ( ) i í %g e R=.
- Upload Ç⁻ " €O&Ü í %\* ( ) < target s t u L J upload 3=.
- JDBC Driver ( ) < upload– ! „ J ! \${SERVER\_HOME}/lib/datasource< =.

## 4. Connection Test

DataSource • Ñ k Üm# Connection Test [ \ " €O&Ü W[ 3 DataSourceem ¢\* \_\_¬ A%ÚB  
efg e R=. [ • @I J \_\_¬< 3 „ • "JDBC Connection is successfully tested" s! f - O  
~P3=.

i Š "Driver Class[€ß%Ò] does not exist." s! 9: f - O ~P^ „ • , Vİ driver classO  
[ • @I J òJ , –8 RI h <m ¢\* classpathO W[ –8 R! p » A\* =.

classpath! WAS • Ñ > Environment > JVM Settings ã m ÇO\* =.

W[ ,

!

CLASSPATH="\$\{CLASSPATH}: \$\{CATALINA\_HOME}/l i b/datasource/oj dbc6.  
jar"

4.3.10. Application List

WY

kÜ • ³ P SERVER ÁÂB í %&z Server —¾" WX\* =. 56 ÁÂm# p1g ServerP Application" í %\* =. p1O ~ J 3 ApplicationP @Ø" WX&! kÜ" CD\* =.

Application @ØP à@r ÞB´ . =.

Table 21. Application List à@

VW	I J	X)
Type	p1g ApplicationP æþ	
Base Name	Base Ò	
Context Path	Context „ J	
DocBase	ApplicationP NX	
Status	Application • þ	ÞB´ . r • þB CD2  ¥ Started(v) ¥ Stop([ ) ¥ Error(!)
	Action Ç´	ÞB´ . r M• " CD2  ¥ Undeploy(bcd) [ \ ¥ Application Start [ \ ¥ Application Stop [ \ ¥ Application Reload [ \
	View Ç´	ÞB´ . r M• " CD2  ¥ web.xml View(Ln) [ \

Deploy

Application " p1&M N\* «. r ÞB´ . =.

Table 22. Application p1 «.



VW(*! _Ra)	I J	X)
Application Type	p 1 g ApplicationP æp	
Context Path(*)	Context „ J	
unpackWAR	WAR( ) " i Œ&' ° # >f g ýApP z Y. ] < falseA „ • , WAR ( ) P %„ " ° p q' p 1	Default : true
DocBase(*)	ApplicationP NX	Upload op(qr) [ \ " GV ( ) " òJ, g e RÐ

## Application Upload

ž t P p 1 ² %½< Ÿ! „ • ManagerB GV application" upload g e R=.

!

1. #ç B í %\* Q Applications B í %&z Application k ŸI J <` \* =.
2. Applications k Ÿ &³ P Application Deploy † Ÿm#, DocBase à@ • 6 wm R!  
Upload op(qr) [ \ " €O&Ÿ ( ) ² %½ k Ÿ< ~P3=.
3. upload g target s t u L (Server ± Host)B í %\* =.
4. Upload [ \ " €O&Ÿ application ( ) " í %g e R! k ò< <. 3=.
5. p 1 g application ( ) " í %&' Upload [ \ " €O&Ÿ í %\* ( ) < target  
s t u LJ upload 3=.

## Import

Import [ \ " €O&z , [Resource] ÁÂm# aØ\* Application [ > B OQ⁻ p 1 g e R=.

I ] ] / 1 2

Application @ØWX k Ÿm# Application Name" í %&Ÿ Application W[ KLk Ÿ" WXg e R=.

Application Descriptor ⁀ DataSourceem Φ\* W[ \ KL M• " CD\* =.

Application W[ Æ„ r í %\* Serverm#i O• &=.

## Application Settings

Application Descriptorm W[ 3 [ > B KL \* =.

stf; (u) [ \ " €O&z Application @Øk ŸI J ² P³ e R=. Expand all [ \ " €O&z  
ContextP ÇO@A «. " W[ g e R=.

DocBase⁀ ContextPath! e[ g e ŸI h, «. P UÑ\* [ > ! ÞB⁀ . =. é? k Ÿm# > <p  
q! «. r Expand all [ \ " €OV » Ag e R=.

Table 23. Application Setting

VW(*! _Ra)	I J	X)
DocBase(*)	ApplicationP Document Base	
Context Path(*)	Context „ J	

VW(*! _Ra)	I J	X)
unpackWAR	WAR( ) " i Õ&' ° # >f g ýApP z Y. ] < falseA „ • , WAR ( ) P %„ r ° Lp q' , 4 ´ qLr <; r ³ p %„ 3 ®J ÷ pX	Default : true
reloadable	Application Æ„ ² (Class File) ÷ O† z Y	
privileged	Container ServletP ST z Y	
cookies	session identifier G- m cookie ST z Y	
useHttpOnly	client sidem# %È ÙÚB z T&z session IDJ P ÄÄ o³ z Y	
sessionCookieDomain	W[ µ" „ • 4 8qLr <; m# W[ 3 + , t ÄÄ" ¶8. .W[ &p q" „ • 4 8qLr <; m PV - &3 domain< ST /	
sessionCookieName	W[ &Ü Vİ <YI J + , Ñ; „ SO <. /	Default : JSESSIONID
sessionCookiePath	W[ g „ • 4 8qLr <; r Vİ „ JB ST	
useNaming	J2EE q¹ ° " N* JNDI InitialContextB ST &M NV W[	Default : true



Add Attribute [ \ " ST&z «. ] " ÇOg e R=.

## DataSource Link List

Global DataSourceB Applicationm# STg e Rt Ø W[ M• " CD\* =.

DataSource ÕÈ KLP «. r Þß⁻ . =.

Table 24. DataSource ÕÈ KL «.

VW(*! _Ra)	I J
Name(*)	Applicationm# STg JNDI < Y
JNDI Name(*)	Global DataSourceP JNDI< Y
UserName	DataSource Ä« STU Ò
URL	JDBC URL
Description	DataSourcem Φ* WÒ
+ MNO	New [ \ , R] (^_) [ \ " €O&z í %3 DataSource[ > O Æ„ ¼\ " §²
- MNO	` =(bcd) [ \ " €O&z í %3 DataSource [ > O NC/ " §²

New [ \ " €O&Ü - » W[ " ÇOg e R' , Save [ \ " €O&Ü Æ„ 3 W[ < Tæ3=.

!

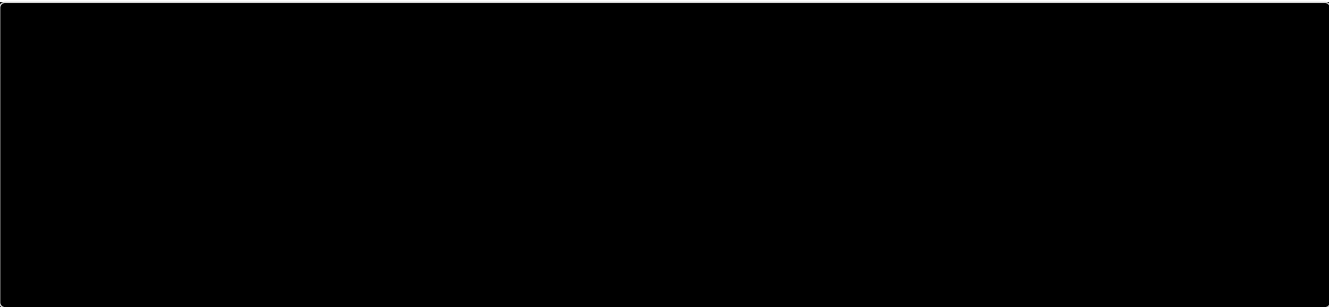
WASm W[ 3 Datasource ¼ ScopeO Global | ! Global + ResourceLinkJ – 8R!  
DatasourceO - » W[ ² JNDI NameP í %à @I J ° ȡ =.

## 4.4. Web Server

Web ServerB KL&M N\* k Ü" CD\* =. Nodem WX\* Web ServerP aØ, e[ , NCO O• &h, ² • F ª J B e f g e R=.

### 4.4.1. WY

Web Server ListB G&z ] Web ServerB KLg e R=.



Web ServerP « . r Þ³´ . =.

Table 25. Web Server « .

VW(*! _Ra)	I J	X)
Status	ServerP • p	Þ³´ . r • pB CD2  * Started(v) * Stop([ ) * Error(!)
Name(*)	ServerP < Y	
Address	ServerP IPĖ /	
Server ID	ServerP ID	
HTTP Port	HTTP 1 Ú8š	
HTTPS Port	HTTPS 1 Ú8š	
SSL	Shell >f ² SSL MOP O%>, STz Y	Web Serverm SSL K{ W[ " VÝ2
	ServerP ² • \ ª J	
+ MNO	Register [ \   ! - [ \ " €O&z í %3 Server [ > O Ą, ¼\ " §²	
- MNO	` =(bcd) [ \ " €O&z í %3 Server[ > O NC/" §²	
	Action(É) [ \ " €O&Ü Forced StopF Forced RestartB e f g e R! ÁÃ CD	

### 4.4.2. Install

1. **Install** [ \ " €O&z ServerP WXB `` \$\* =.
2. Server ID` Service PortB EP\* =.
3. **Save** [ \ " €O&z Tœ\* =.



Nodem >C WX- 8 R! Server` Managerm# KL&! ServerP [ > m! o<O R" e R=. (consoleMO WX ²)



Server ID ¼µ 9: O ; <&! „ • , Register M• " <T&z WX3 Server [ > B ÇOJ »AVÝ \* =.

### 4.4.3. Clone

1. **Clone** [ \ " €O&z Web ServerP µCB `` \$\* =.
2. Node ListB í %&z µCg ServerB í %\* =.
3. Clone Server ID` Service PortB EP\* =.

(Include External Source! =´ ^ , J #çB µC&! „ • STO• &h, µCg #çP Document Root s t uLm R! ( ) t 2Ó µC&! p z YB W[ \* =.)

4. **Save** [ \ " €O&z Tœ\* =.



Nodem >C WX- 8 R! Server` Managerm# KL&! ServerP [ > m! o<O R" e R=. (consoleMO WX ²)



Server ID ¼µ 9: O ; <&! „ • , Register M• " <T&z WX3 Server [ > B ÇOJ »AVÝ \* =.

### 4.4.4. Register

1. **Register** [ \ " €O\* =.
2. aØ&Ū! ServerB í %\* =.
3. **Save** [ \ " €O&z Tœ\* =.

### 4.4.5. R]

1. **R]** (^\_) [ \ " €O&z Server [ > B e[ O• \* • pJ Æ„ \* =.
2. ServerP « . " e[ \* =.
3. **Save** [ \ " €O&z Tœ\* =.

### 4.4.6. ` =

1. ` =(bcd) [ \ " €O&z Server[ > B NC O• \* • pJ Æ„ \* =.
2. **Save** [ \ " €O\* =.
3. **OK** [ \ " ` vÜ NC åæ" í %&! I < ~P3=.

è Unregister : Manager DBm#i VÍ Server [ > B NC&’ ôL@A Server engine å p (ÇQ Register [ \ " GV =² aØO•)

è Uninstall : Manager DBm# VÍ Server [ > B NC&' ôL@A Server engine t NC

4. Uninstall í %² , J ç s t u L NCz YB v! I < ~ P3=.

!

Server Clusterm ±z R! #ç! NCg e Ý=.

!

ADMIN > Preference > Manager Environment ÁÂP Manager Configuration  
† ūm# use Server Delete Protection ] " trueJ W[ &! „ • Managerm# #ç O  
uninstall–! ý" ñp g e R=.

#### 4.4.7. Start/Stop

##### Single Start/Stop

1. Stop [ \ " €O&z ServerB <sup>a</sup> J \* =.

2. Start [ \ " €O&z ServerB <sup>2</sup> • \* =.

"

ServerB ¼p² General x P Stop Mode m Ôs <sup>a</sup> J ñ | < \* s Í =.

Stop : Mú <sup>a</sup> J • ; I J —÷ # \$ % ¼A • ò" > æ&p q! =.

Graceful Stop : —÷ # \$ % ¼A • ò" ~ J \* Q <sup>a</sup> J \* =. (Window m#! # \$ %  
> æ&p qĐ)

!

<sup>2</sup> • O • \* • p) „ • mi Start [ \ < z . k 3=.

##### Multi Server Start/Stop

1. <sup>2</sup> • { r <sup>a</sup> J &' U &! µeÕP ServerB í %\* =.

2. Server @Ø &³ P Multi Action [ \ " €O\* =.

3. k òI m# Action Type" í % Q Action [ \ " €O&z µeÕP Serverm Φ\* <sup>2</sup> • { r <sup>a</sup> J  
• ò" ef \* =.

##### Forced Stop/Restart

1. Server @Ø Oœ • 6P É [ \ " €O\* =.

2. - C <sup>a</sup> J { r - C ÷² • " ef \* =.

#### 4.4.8. I ] ] / 1 2

Web ServerP W[ [ > B Æ„ &! M• " CD\* =. Web Server @Øm# ServerB í %&Ü W[  
[ > B KL&! k ÜI J <` \* =.

##### General

Web ServerP ) O@A W[ ] F Connection, Process [ > B Æ%g e R=.

Web ServerP W[ [ > ! Tœ² W[ ( ) m Φ\* Validation" ef &d – 8 RI h, W[ ( ) 9: J  
A\* Server M` œ´ O ; <" é/k&' R=.

!

W[ ( ) 9: ² ( ) < Tœ–p q’ 9: Á² pO ~P3=

9: Á² p ,

AH00526: Syntax error on line 253 É Argument for 'Require all' must be 'granted' or 'denied'

W[ [ > P • Ñ ãTr =ÐF . =.

1. Server Info (env.shF /conf/httpd.conf ( ) KL)

Table 26. Server Info

VW(*! _Ra)	I J	X)
HTTP Port(*)	HTTP Port	
HTTPS Port(*)	HTTPS Port	
Staging HTTP Port	Staging +, J M` ² ST&! # \$% 1 Ú	Graceful restart ² m <T /  LENA! Mú nostage +,
Staging HTTPS Port	Staging +, J M` ² ST&! HTTPS 1 Ú	Graceful restart ² m <T /  LENA! Mú nostage +,
Install Path	Server WX „ J	
Document Root(*)	Web Serverm# CD&! f # 6< Tœ– 8 R! Mú • } „ J	
Welcome Page	4S<ÚP ?M4<p f #J 8¼ ( ) " STg ýAp [ P	
Stop Mode	WEB #çª J² äW&! • ;	Stop : Múª J • ; I J —÷ # \$%¼A • ò" > œ&p q! =.  Graceful Stop : —÷ # \$%¼A • ò" ~ J * Qª J * =. (Window m#! # \$% > œ&p qÐ)
Directory/Path	8¼ # \$%˘ M• " ' T/nY gpB W[ g 4 f # 6< R! stuL „ J	

VW(*! _Ra)	I J	X)
Directory/Options	p[ * st uL <&P +, ( ) F st uL6m @Tg ÃÄ C8 W[	Indexes : welcome pageB ½" e Ÿ" ù, Document Root &NP ( ) @Ø" > z Ě! ý" ñp  FollowSymLinks : Document Root &Nm MI P 4f # <\$P ( ) ² %½m ¾yOöËJ ÃÄ &! ý" ñp
Directory /AllowOverride	Document Root &N st uL ž L/% ÃÄ C8 W[ ( ) ( ) O@I J AccessFileName : .htaccess)m ¢&z 8¼ p² U ST" ' Og ýAp W[	=ÐF . r åæ< I ÷ 2  * None : 8' * p² Ut ' T&p qÐ * All : +, p² U STO• * AuthConfig : STU A§ p² U ' T * FileInfo : f # åæ C8 p² U ' T * Indexes : st uL Indexing C8 p² U ' T * Limit : š %Ú ÃÄ C8 p² U ' T
Directory/Require	A§ 3 STUO ' O3 Action" ef &! p – §	

## 2. Connection Info (/conf/extra/httpd-default.conf ( ) KL)

Table 27. Connection Info

VW(*! _Ra)	I J	X)
Timeout(*)	€s <¿ Úˆ Server^m _¬ Q ) [ ² ^ ` . p• <CÚO ; <&p qÄ" ù ServerO M=L=O _¬" Ä" ² ^ (s)	Default : 60
KeepAlive(*)	K[ * „ J Ñ%O K[ STUP ) + • ò" I « V# üLgp z Y	Default : On
MaxKeepAliveRequests (*)	KeepAliveO On) ù å" * ] I J &° P „ J Ñ%O K[ STUP ) + " p[ * Äei Ä üL  < ] " Ä8#Ü Vĭ „ J Ñ%! Ä' = ´ „ J Ñ%O ) + " üL2	Default : 100

VW(*! _Ra)	I J	X)
KeepAliveTimeout(*)	KeepAliveO On ) ù å" * ] I J W[ * ² ^ ` . ) + < ÝI Ü _¬" ÁM NV Ž\p3 ² Æ(s)	Default : 5
RequestReadTimeout(* )	STUJYZ request header¬ bodyB , M NV M=L! ² ^  W[ 3 ² ^ . m , p Ç&Ü 408 REQUEST TIME OUT m®B > È	Default : header=20-40,MinRate=500 body=20,MinRate=500

### 3. Process Info (/conf/extra/httpd-mpm.conf ( ) KL)

Table 28. Process Info

VW(*! _Ra)	I J	X)
StartServers(*)	Web Server M` ² ? Mk -! Server „ J Ñ% e	Default : 2
ServerLimit(*)	MaxClientsO < . g e R! éÇ „ J Ñ% ]	Default : 8
ThreadLimit(*)	ThreadsPerChildP W[ O• * éÇ ]	Default : 128
MinSpareThreads(*)	Idle • pm# Idle Thread ŒeO < ] > = @" ù ThreadO < ] Ép Ê8° åp	Default : 128
MaxSpareThreads(*)	Idle • pm# Idle Thread ŒeO < ] > = È" ù ThreadO < ] Ép æ868 åp	Default : 256
ThreadsPerChild(*)	] ] P U  „ J Ñ%O < . &! Thread e	Default : 128
MaxRequestWorkers(*)	j H U  „ J Ñ%O < . g e R! éÇ Thread e	Default : 1024
MaxConnectionPerChild(*)	U  „ J Ñ%O # \$ % g e R! éÇ ) + e . < ] i Ä ) + " üL * Qª J * =.	Default : 0 (0: C* ÝĐ)

### 4. Pagespeed Info

Table 29. Pagespeed Info



VW(*! _Ra)	I J	X)
Enabled(*)	mod_pagespeedB @T&z Web ServerO CD&! Resourcem Φ* é@k B ef &z S<Ú « t B Ì ) p z Y	Default : off  =DF . r • ; " CD2  ¥ on : Resource6m ΦV é@k ' T  ¥ off : ÇO@A é@k B ¼p&°, MI m é@k – 8R! Resource6m Φ* ÄÄ ' T  ¥ unplugged : é@k ¼p \ ÄÄ '
RewriteLevel(*)	+ 1 < rewriteg ( Z P Level W[	Default : default(CoreFilters)  =DF . r • ; " CD2  ¥ CoreFilters : S j m ΦY&P 4S<Úm# · j &=' <] &! ( Z O 1 2– 8RÐ  ¥ OptimizeForBandwi dth : · j . " – k &h, PagespeedB A  &p Ç&! S<Úm# ST&M @H  ¥ PassThrough : ( Z B i Y e` I J EP
FileCachePath(*)	Caching ^ File6< Tœ– ! s t u L P „ J	
LogDirPath(*)	LogB MØg s t u L P „ J	
EnableFilters	STg ( Z 6P @Ø	
DisableFilters	ST&p q" ( Z 6P @Ø	

VW(*! _Ra)	I J	X)
Allow URI	rewriteB ' Tg Resource6P - ), í , (*)B 1 2* URI	, ) /js
Disallow URI	rewriteB ' T&p q" - ), í , (*)B 1 2* URI	



W[ " Æ„ g „ • e[ 3 Sà P O†" N&z ServerP ÷M` < ( ) &=.

## Connector

Web ServerP Connector[ > - Load Balancer[ > B Æ%g e R=. Connector Info † û P [ > ! Web Server ã m W[ 3 Load BalancerP Mú W[ ] " , Load Balancer† û r Web Server- WASB \_I &! [ > B K L \* =.

W[ [ > P • Ñ ã Tr = ð F . =.

1. Connector Info (/conf/extra/httpd-jk.conf- /conf/extra/workers.properties ( ) K L)

Table 30. Connector Info

VW(*! _Ra)	I J	X)
Type(*)	Web Server- WASO G- g ù ST&! „ J u...	ajp 13
Load Balancing Factor(*)	WASP Y& &€ pe. V, • òÎ gİ \$•	Default : 1
Socket Timeout(*)	JK- WAS ^m ê™ ¢M² ^ (TCP socket ã Y@A • þm ¢* timeout" P5, s)	Default : 300
Socket Connect Timeout(*)	JK- WAS ^P socket __ ñ ¢M² ^	Default : 5000
Socket Keepalive(*)	Web Server- WAS ^m ñk™ < R! „ • inactive • þA connectionr ç L d – 8 R! ' OSm keep alive Á² pB > ã# ñk™ < inactive connection" Ĩ sç L! ý" • " p z Y W[	Default : true
Connect Timeout(*)	JK- WAS ^m __ ñ < ~ J 3 Q, ajp13 „ J u...m# P cping requestm ¢* cpong respond ¢M² ^ (ms)	Default : 10000
Connection Pool Size(*)	JK- WAS ^m † ‡; " cache&! È M	Default : 128
Connection Pool Min Size(*)	JK- WAS ^m † ‡; " cache&! é / È M	Default : 32
Connection Pool Timeout(*)	Connection poolm#socket" close &MÉ p open3 socket" å p&!² ^	WASm# connectionTimeout W[ F . < W[ VÝ 2
Log Level(*)	m® J ¿ ( ) P MØ ã T" â B° UÑÐ MØgp p[	Default : error

VW(*! _Ra)	I J	X)
Log Format(*)	J ȷ ( ) m 8¼ 1 ÑI J J ȷ B Ò^ p W[	
Status(*)	Server • þ +î Z õ W[ ] ÓÔ z Y Enable í %² Status UriF Allow IPB W[ g e RÐ	Default : Enable
Status Url(*)	Server • þ +î Z õ URL	Default : /jk-status/
Status Allow IP(*)	Server • þ +î Z õ URLm ÃÄ Ö• * IP	Default : 127.0.0.1

## 2. Load Balancer Info

(/conf/extra/workers.properties, /conf/extra/uriworkermap/uriworkermap\_\ {Virtual Host ID}.properties, /conf/extra/vhost/\ {Virtual Host ID}.conf ( ) K L)

Table 31. Load Balancer Info

VW(*! _Ra)	I J	X)
LB ID(*)	Load BalancerÒ	
Sticky Session	Session IDB MOI J s • Ô" p" gp z Y	Default : true
Status Enabled	Server • þ +î Z õ ST z Y ` ) Virtual Hostm @T3 Load Balancerm ΦV#! ) Ò @T/	Default : N
Virtual Host ID(*)	Load BalancerB @Tg Virtual Host ID	Virtual Host x" GV KL/
Session Cookie	Session Cookie Name" Æ„ &' U g „ • W[ (WASm# Session Cookie Name Æ„ ² . < Æ„ VÖÝ 2)	Default: JSESSIONID
URI Patterns(*)	Web serverJ 68α ) +6m ΦV URIO×" – S&z WASJ i * &! uri mapping" [ P	

VW(*! _Ra)	I J	X)
Method(*)	Load Balancer O Y&B &€&M @¤* workerB < ž &! ' STg Á#,	=ÐF . r ŽE" CD2  ¥ R[request] : ) +eO Oœ @r worker í %. (Default)  ¥ S[ession] : _¬3 Ñ; < Oœ @r worker í %  ¥ N[ext] : S[ession]F \$Ø&pi } @r eP session" &€VÝ &! „ • í %  ¥ T[raffic]Ê: JK` AJP† ‡Z S<m _Ú>È ÚßÚ< Oœ • r worker í %  ¥ B[usyness] : ) + eB MOI J Oœ Y&O @r worker í %f
Redirect	Vİ workerO error • p) ù , r ) + " ¢- ÜLg failover workerB W[	Default : Round Robin
LB Factor	• òÎ gİ \$• . Vİ workerO âB° Ęr ) " gp [ P (5J W[ g „ • 1J W[ * =´ worker> = 5p } Ęr requestB , Ð)	

URI Pattern [ > ! /conf/extra/uriworkermap/uriworkermap\_{Virtual Host ID}.properties ( ) m  
KL3=.

WAS ListP [+] ¢` " GV Load Balancer` \_I -! WASB ÇOg e RI h, ÇO3 WASP Ú ¢` "  
GV Vİ WASB C\$g e R=.

\_I WAS [ > ! /conf/extra/workers.properties ( ) m KL3=.

! W[ " Æ„ g „ • e[ 3 SàP O† " N&z ServerP ÷M` < ( ) &=

## Virtual Host

Web ServerP Virtual Host [ > B aØ/e [ /NCg e R=.

New [ \, Delete [ \ " GV Virtual HostB aØ/NCg e R=.

1Ö <• P Load BalancerB @T\* Virtual Host! NCg e Ý=. i Š Vİ Virtual HostB NC&ÜÜ,  
ÛT Connector x" GV Load BalancerP Virtual Host IDB =´ Virtual Host IDJ Æ„ VÝ \* =.

SSL Enabled Rewrite Enabled B H È \* „ • Þ ß - . < • Ñ à @ † û < Ç O J ~ P 3 = .

W [ [ > P • Ñ ã T r = Ð F . = .

(/conf/extra/vhost/\{Virtual Host ID}.conf, /conf/extra/rewrite/rewrite\_\{Virtual Host ID}.conf, /conf/extra/ssl/ssl\_\{Virtual Host ID}.conf ( ) K L)

Table 32. Virtual Host W [ [ >

VW(*! _Ra)	I J	X)
Virtual Host ID(*)	Virtual Host < Y	
Port(*)	V ĭ O • š % Ú O S T & ! HTTP Port	
DocumentRoot(*)	V ĭ O • š % Ú P Ž 4 < p s t u L N X	ServerP DocumentRoot Æ e A \${DOC_ROOT}B z T & z ` ) & d { r , ¿ & N J p [ O •
ServerName(*)	V ĭ O • š % Ú P † Á A Ò	
ServerAlias	V ĭ O • š % Ú O S T & ! ServerAlias	- ) , Í , f U 1 2 O • (*.example.com)
ErrorLog(*)	V ĭ O • š % Ú P 4 m ® J ¿ ( ) N X	
CustomLog(*)	V ĭ O • š % Ú P 4 J ¿ ( ) N X	
Directory/Path	DocumentRootm# p [ * „ J	
Directory/Options	p [ * s t u L < & P + , ( ) F s t u L 6 m @ T g Ä Ä C 8 W [	-Indexes! welcome pageB ½" e Ÿ" ù, Document Root & N P ( ) @ Ø" > z È! ý" ñ p  -FollowSymLinks! Document Root & N m M I P 4 f # < \$ P ( ) ² % ½ m ¾ y O õ È J Ä Ä &! ý" ñ p

VW(*! _Ra)	I J	X)
Directory/AllowOverride	Document Root &N s t u L ž L / % ÃÄ C8 W[ ( ) () O@I J AccessFileName : .htaccess)m ¢&z 8¼ p² U ST" ' Og ýAp W[	=ÐF . r åæ" CD2  ¥ None : 8' * p² Ut ' T&p qÐ  ¥ All : +, p² U STO•  ¥ AuthConfig : ST U A§ p² U' T  ¥ FileInfo : f # åæ C8 p² U' T  ¥ Indexes : s t u L Indexing C8 p² U' T  ¥ Limit : š %Ú ÃÄ C8 p² U' T
Directory/Require	A§ 3 ST U O ' O3 Action" ef &! p – §	
Rewrite Enabled	RewriteST z Y	
Rewrite Conf	RewriteK{ • Ñ W[ . p[ * Rewrite Conditionm Ôs Rewrite Rulem W[ * rule¢J rewrite2	
Proxy Enabled	Proxy ST z Y	conf/extra/proxy s t u L m W[ ( ) < NX* =. ( ) * „ • ProxyPreserveHost B Óò&Ü ) +P host Ò" åpg e R=. default ] r off <h ( ) * „ • on * =. (ex: application m# redirect ST ²)
Proxy Pass Match	backend` _` &M N* [ »   O×F Target # \$ % t ÁÄË /	
DNS Lookup Interval	DNS Lookup Ë M(s)	Default: 10
SSL Enabled	SSL ST z Y	
SSLPort(*)	HTTPS Port	

VW(*! _Ra)	I J	X)
SSLCertificateFile(*)	SSL A § # , J	
SSLCertificateKeyFile(*)	SSL A § # Key( ) , J	
SSLCertificateChainFile	File of PEM-encoded Server CA Certificate	
SSLCACertificateFile	ROOT A § # , J	
Https Redirect Enabled	HttpÜHttps Redirect ST z Y	
SSL Log Separation	SSL Log W[ &L ST z Y	
SSLErrorLog	SSL Error Log W[	
SSLCustomLog	SSL Custom Log W[	

! W[ " Æ„ g „ • e[ 3 Sà P O† " N&z ServerP ÷M` < ( ) &=

Logging

Web ServerP J ¿ W[ [ > B Æ%g e R=.

W[ [ > P • Ñ ãTr =ÐF . =.

1. Log Home

Table 33. Log Home

VW(*! _Ra)	I J	X)
Log Home(*)	Log Home , J	default í %² #çWXst uL &N logs • } J W[ , custom í %² Log Home Prefixà @m# J¿st uL Ž „ J EPO•
Retention Days(*)	J¿ éΦ > K ) e	Default : 0(• C*)

2. Error Log

Web serverO Í ³ [ > ^ requestB üL&! t¼m ; <\* 9: B MØg ù ST3=. ServerO  
² • &n° ` • &! ' f CO ; <² z Mm W[ 3 NXP ( ) " ÛT » A\* =.

Table 34. Error Log

VW(*! _Ra)	I J	X)
Location(*)	Web serverP m®J¿ ( ) NXB p[	

VW(*! _Ra)	I J	X)
Log Level(*)	m®J ¿ ( ) P MØãT" â B° UÑ&d MØg p p[	

3. Custom Log

J ¿ ( ) <YF æ| " W[ \* =. f„ ÆeB ST&z requestP KÝm Ôs í %@I J J ¿ B Ò^ e  
R=.

Table 35. Custom Log

VW(*! _Ra)	I J	X)
Location(File Pipe)(*)	File: m®J ¿ ( ) NX  Pipe: ( <„ f U " " Æm J ¿ [ > B §¨ EPI J , " „ J ¿ P „ J	
Format Nickname(*)	J ¿ ( ) m MØg ãT  Log FormatI J [ P* nickname" ßn° ÝÃ J ¿ 1Ñ" • .	
Env	ServerP f„ Æe å• m Ôs J ¿ B MØgp zY • .	



, B 68, †8Å STUP ) +F \$†8Å STUP ) +" =´ J ¿ ( ) m MØ&'  
¢r „ • =ÐF . < W[ g e R=.

W[ ,

Location Format Env

logs/english\_log common english

logs/non\_english\_log common !english

4. Log Format

J ¿ ( ) m STg æ| " W[ \* =.

Table 36. Log Format

VW(*! _Ra)	I J	X)
Format(*)	J ¿ ( ) m 8¼ 1ÑI J J ¿ B Ò^ p W[	
Nickname(*)	CustomLogm# STg J ¿ 1Ñ Ò	

5. Log Format with logio

Table 37. Log Format with logio



VW(*! _Ra)	I J	X)
Format(*)	J ħ ( ) m 8¼ 1ÑI J J ħ B Ò^ p W[	%l~ %0 ÆeB STV request~ headB 12&z > ā' , ! byte 6[ < O•
Nickname(*)	CustomLogm# STg J ħ 1Ñ Ò	combinedio! mod_logio_module< J , - 8 R8Ý 2

## 6. Env

RequestP Wà m Ôs f„ ÆeB W[ g ù ST \* =.

Table 38. Env

VW(*! _Ra)	I J	X)
Attribute(*)	HTTP ) + á } (ex: Host, User-Agent, Referer, Accept-Language), ) + « . ¼ &° (Remote_Host, Remote_Addr, Server_Addr, Request_Method, Request_Protocol, Request_RUI)   ! ) + F _K 3 f„ Æe < Y	
Regex(*)	Perl Š f [ »	
Env-variable[=value](*)	W[ g Æe ÒF W[ ] (optional)  Varname, !varname   ! varname=value	
Case	Env-variablem ¢/f U - &gp z Y	With case : ¢/f U - &  No case : ¢ef U - &ÝÐ

! W[ " Æ„ g „ • e[ 3 Sà P O†" N&z ServerP ÷ M` < ( ) &=

## Environment

JVM • ; , Start ShellP W[ a" KL&! k Ü" CD\* =. ( ) msZB GV e[ \* Q Save [ \ " €O&z Tœ\* =.

¥ Custom Settings (\$CATALINA\_HOME/bin/customenv.sh): STU † %Ž f„ Æe W[

¥ Start Shell (\$CATALINA\_HOME/env.sh) - Server ² • " N\* Shell Script

!

Mú@I J W[ " e[ g e Ýt Ø - 8 R=. e[ &' ¢r „ • ADMIN > Manager  
Environment > Manager Configuration à@m# I ] [ \ " €OV Þß W[ " false  
J Æ„ \* =.

```
server.environment.envshell.readonly=false
```

Config Tree

Web ServerP \${SERVER\_HOME}/conf s t u L &N W[ ( ) 6" ( ) Ĳ%MB GV KL g e R=.

!

Node AgentB >f &! STUO Web Server W[ [ > ( ) P ÃÄ Å\* < R8Ý  
e[ < O• &=. ÃÄ Å\* < Ý" „ • ( ) Write Å\* < Ý8 Ĳ% g e Ý=!  
Á² pO ~P 3=.

History

W[ [ > P ~ò \ μ" M• " CD\* =. W[ [ > B e[ &z Tœ&Ü HistoryB KL \* =. e[ ) ² B  
EP&z –£\* =.

/; (k /; ) [ \ " €O&z í %\* ( ) P [ > B y e RI h, Restore [ \ " €O&z Vİ  
W[ ( ) J μ" g e R=.

# Chapter 5. Resource

## 5.1. Database

5.6 ÅÂm# DatabaseB í %&Ü Database Resource @Ø< WX3=.

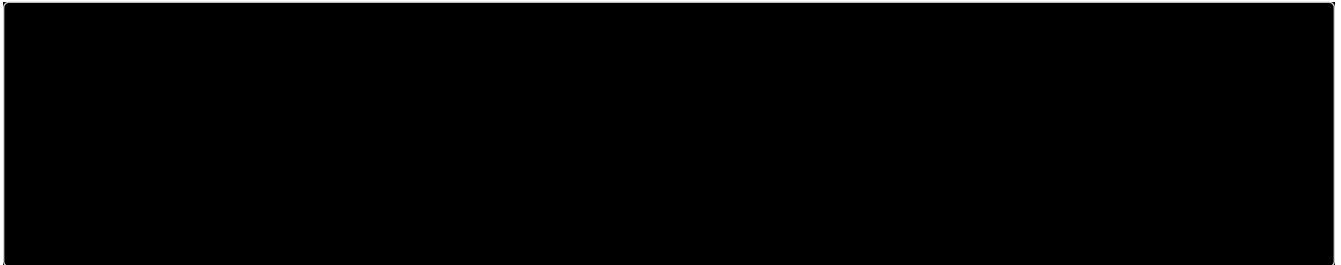


Figure 7. Database @Ø WX k Ü

### 5.1.1. Database Z Y

1. Database Resource @Øm# New [ \ " €O&Ü - » aØ k Ü< ~P3=.
2. EP à@" EP\* =.  
 è Resource Name" EP\* =.  
 è DriverClassName" » A Q " &! C} P , s<ÇB í %\* =.  
 è Address(host/Port) [ > B EP\* =.
3. Save [ \ " €OV Tœ\* =.

### 5.1.2. Database R]

1. Database Resource @Øm# e [ &Ü! Database ResourceP HÈ â %B í %\* =.
2. Database ResourceP à@" e [ \* Q Tœ\* =.

!

ãT< e [ ^ „ • Vİ Database Resourcem \_\_→3 DataSoruce Resource\ WASP  
 W[ m i ( – J , Vİ Database Resource &Nm \_\_→3 DataSoruce ResourceO  
 I ÷g „ • EPI < MÚ@I J Disable 3=. Edit [ \ " €O&Ü e [ g e R=.

## 5.2. DataSource

5.6 ÅÂm# DataSourceB í %&Ü DataSource Resource @Ø< WX3=.

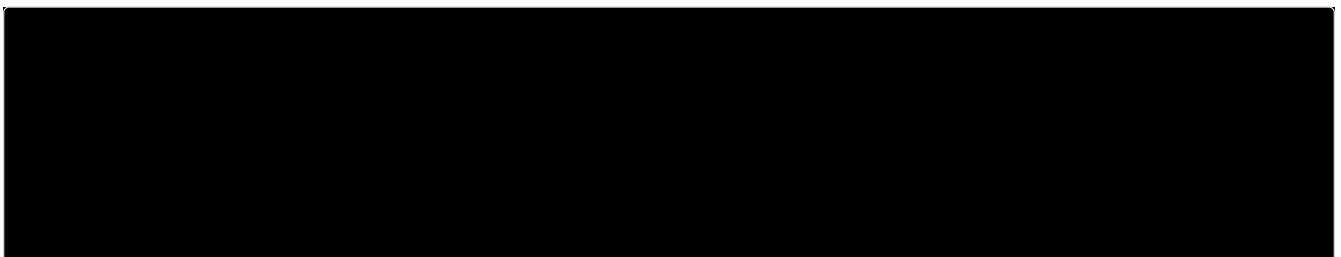


Figure 8. DataSource @Ø WX k Ü

### 5.2.1. DataSource Z Y

1. DataSource Resource @Øm# New [ \ " €O&Ü - » aØ k Ü< ~P3=.
2. Resource Name ( , m LL@A <Y" EP\* =.
3. DataSourceP • Ñ W[ " \* =( <Server DataSource W[ >>P • Ñ à@ WÒ ä' )
4. Upload [ \ " €O&z VÍ DataSourceP DriverB Manager#çm aØ\* =. 5L aØ3 Driver! ...† UO Serverm Import&! ² ~ m VÍ ServerJ i ÿ3=.
5. Save [ \ ç " €O&z Tœ\* =.

!

Managerm òJ , 3 JDBC Driver! , ...† UO Serverm VÍ DataSource ResourceB Import&! ² ~ m VÍ ServerJ i ÿ3= . i ÿ3 JDBC Driver! {#çŽ „ J }/lib/datasource s t u L m NX&h Classpathm U` I J aØ3=.

### 5.2.2. DataSource R]

1. DataSource Resource @Øm# e[ &' U &! f" í %&Ü DataSource Resource e[ k Ü< §² 3=.
2. Æ„ &' U &! W[ " Æ„ \* =.
3. Save [ \ " €O&z Tœ\* =.

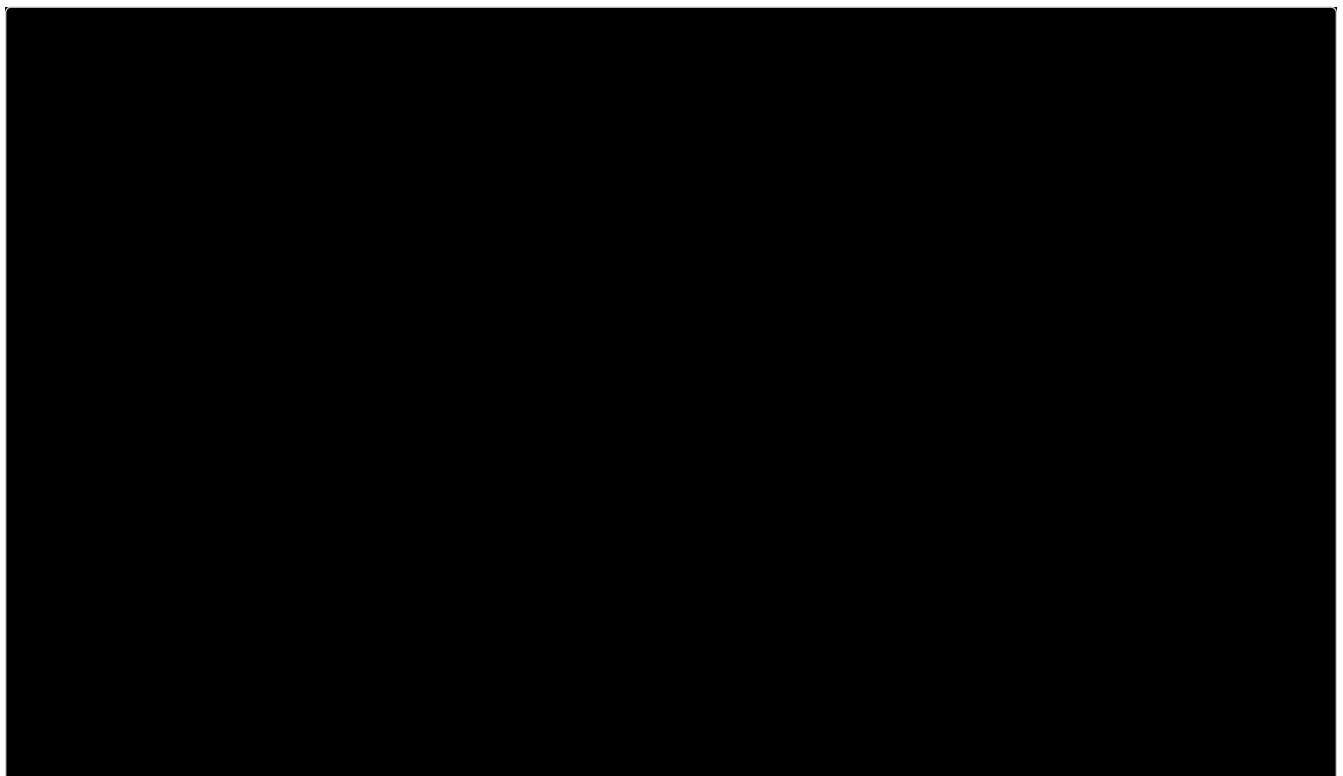


Figure 9. DataSource • Ñ [ > k Ü

!

DataSource Resource [ > B e[ \* Q Tœ&Ü VÍ DataSource ResourceO ST– ! Serverm Æ„ 3 W[ < i ( 3= . W[ < i ( 3 ServerB ÷M` &Ü VÍ W[ < @T 3=.

||

Classpath aØ Q DataSource Resource NC ² , Classpath! NC– p qÐm åPVÝ \* =.

### 5.2.3. DataSource ` =

1. DataSource Resource @Øm# NCg DataSource ResourceP HÈ â %B í %\* =.
2. Delete [ \ " €O&z NC\* =.



Server | ! Applicationm# Import&z Registered Server | ! Registered Application< | ÷ &! „ • , VÍ DataSource Resource! NCg e Ý =.

### 5.2.4. JDBC Driver Upload

1. DataSource Resource aØ { r e[ k Üm# Upload [ \ " €O&Ü Driver File" Upload g e R! k Ü< ~P3=.
2. qrop [ \ " €O&z Local PCm# upload &' U &! Driver File" í %\* =.
3. Upload [ \ " €O&z ManagerJ Driver File" Upload\* =.

### 5.2.5. DataSource Import

< . \* DataSource ResourceB ImportV# ST &' R! Server @Ø(ScopeO Context, Global, Global + LinkA „ • ) | ! Application@Ø(ScopeO ApplicationA „ • )r DataSource Resource • Ñ WX ² &³ † ùm §² 3=.

DataSource v w : x y n DataSource Import z ;

ScopeO Context, Global, Global + LinkA DataSource Resource! U- " Import&! ServerB aØg e R=.

1. DataSource KL k Üm# K[ DataSource ResourceB í %&z • Ñ [ > k ÜI J <` \* =.
2. Edit Server List [ \ " €O&Ü ServerB aØ KL g e R! I < ~P3=.
3. VÍ DataSourceB Import g ServerB p[ V • 6 † ùI J <` ² ã =.
4. Save [ \ " €O&Ü VÍ Serverm DataSource ResourceO Import 3=.



Import3 DataSource ResourceB Serverm# NC&ÜÜ, ¢• ServerB 56 † ùI J <` ² ã Q Save [ \ " €O\* =.

C9 Servery n DataSource Import z ;

1. LENA Manager • ³ P Servers ÁÂB í %\* =.
2. 56m# Œ Web Application Server > Resources > DataSource x" €O&Ü, VÍ ServerP DataSource Resource @Ø WX \ DataSource Resource ÇOB g e R! k Ü< ~P3=.
3. Import [ \ " €O&Ü k ò I m 5L [ P3 DataSource Resource @Ø< WX3=.
4. Import &' U &! DataSource ResourceB í %\* =.
5. OK [ \ " €O&z VÍ DataSource ResourceB Import \* =.



DataSource ResourceB Import &d – Ü VÍ DataSource Resource Server ^P \_¬ [ > O ãY@I J <. 3=. < \_¬ [ > B MOI J DataSource Resource e [ ² ~ m W[ Æ„ Sà< VÍ Serverm | \* 3=. \_¬ [ > ! Resource > DataSource k Üm# WXg e R=.

!

Import\* DataSource Resource W[ r Server W[ m# ¶%g e ¨=(W[ [ > ! y  
 e Rpi e[ O) W[ " Æ„ &' U \* =Ü Resource > DataSource k ÜI J  
 <` &z Æ„ \* =.

## 5.3. Application

56 ÁÂm# ApplicationB í %&Ü Application Resource @Ø< WX3=.

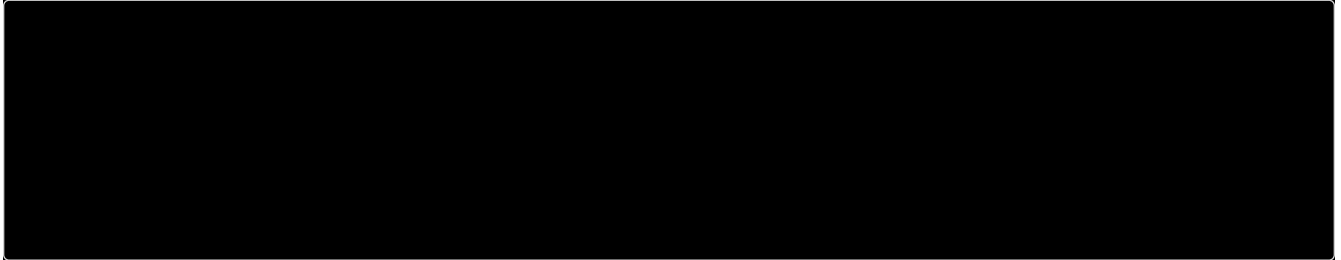


Figure 10. Application @Ø WX k Ü

### 5.3.1. Application Z Y

1. Application @Øm# **New** [ \ " €O&Ü - » aØ k Ü< ~P3=.
2. W[ &' U &! ] " EP\* =.  
 è Application Type< WAR) „ • m! ÇOJ W[ g e R! à@< §² 3=.(• Ñ W[ ] r  
[Application Settings](#) ä' )
3. **Save** [ \ " €O&z Tœ\* =.

### 5.3.2. Application R]

1. Application Resource @Øm# e [ &' U &! f " í %&Ü e [ k Ü< §² 3=.
2. Æ„ &' U W[ " EP\* =.
3. **Save** [ \ " €O&z Tœ\* =.

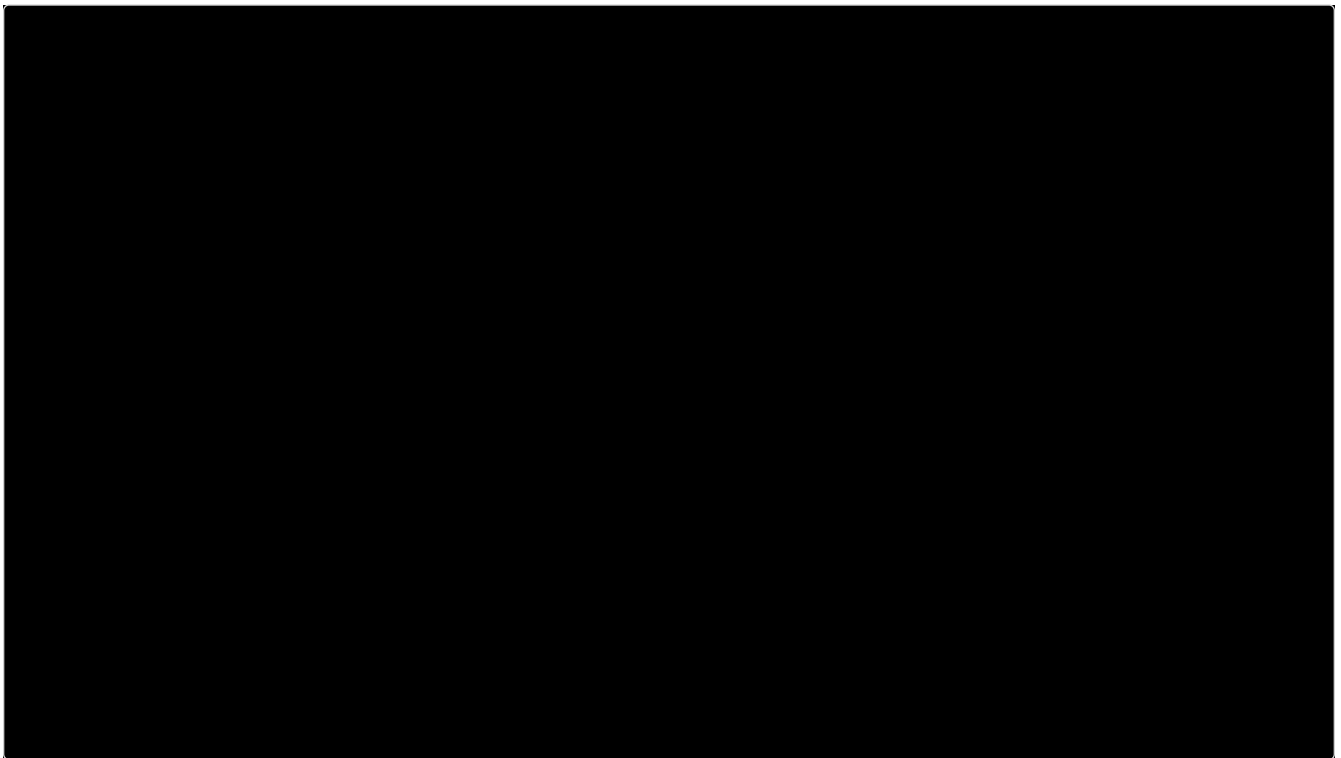


Figure 11. Application • Ñ [ &gt; k Ü

!

Application Resource [ > B e [ \* Q Tœ&d –Ü Vİ ResourceO ST–!  
 Serverm Æ„ 3 W[ < j ( 3=. W[ < j ( 3 Server! ÷M` &d –Ü Vİ W[ <  
 @T 3=.

### 5.3.3. Application ` =

1. Application @Øm# NCg Application ResourceP HÈ â %B í %\* =.
2. Delete [ \ " €O&z NC\* =.

!

Serverm# import&z Registered ServerO I ÷&! „ • Vİ Application  
 ResourceB NCg e ÿ=.

### 5.3.4. Application Upload

1. Application Resource aØ { r e [ k Üm# Upload [ \ " €O&Ü Application File" Upload g  
 e R! k Ü< ~P3=.
2. qrop [ \ " €O&z Local PCm# upload &' U &! Application File" í %\* =.
3. Upload [ \ " €O&z ManagerJ Application File" Upload\* =.

#### Application Import

<. \* Application ResourceB ImportV# ST&' R! Server @Ør , Application Resource • Ñ WX  
 &³ † Üm §² 3=.

Application v w : x y n Application Import z ;

Application • Ñ k Üm# U- " ImportV# ST&' R! Server @Ø" e [ g e R=.

1. Application KL k Üm# K[ Application ResourceB í %&z • Ñ [ > k ÜI J <` \* =.

2. **Edit Server List** [ \ " €O&Ü ServerB aØ KLg e R! I < ~P3=.
3. Vİ ApplicationB Import g ServerB p[ V • 6 † ûI J <` ² ã=.
4. **Save** [ \ " €O&Ü Vİ Serverm Application ResourceO Import 3=.



Import3 Application ResourceB Serverm# NC&ÜÜ, ¢• ServerB 56 † ûI J  
<` ² ã Q **Save** [ \ " €O\* =.

C9 Servery n Application Import z ;

1. LENA Manager • ³ P Servers ÁÂB í %\* =.
2. 56m# ŒŽ Web Application Server > Applications ÁÂB €O&Ü, Vİ ServerP Application Resource @Ø WX \ Application Resource ÇOB g e R! k Ü< ~P3=.
3. **Import** [ \ " €O&Ü k ò I m 5L [ P3 Application Resource @Ø< WX3=.
4. Import &' U &! Application ResourceB í %\* =.
5. **OK** [ \ " €O&z Vİ Application ResourceB Import \* =.



Application ResourceB Import &d –Ü Vİ Application Resource Server^P  
\_¬[ > O ãY@I J <. 3=. < \_¬ [ > B MOI J Application Resource e [ ² ~ m W[ Æ„ Sà< Vİ Serverm j \* 3=. \_¬ [ > ! Resource > Application k Üm# WXg e R=.



Import\* Application Resource W[ r Server W[ m# Æ%g e Ÿ=(W[ [ > ! y e Rpi e[ O) W[ " Æ„ &' U \* =Ü Resource > Application k ÜI J <` &z Æ„ \* =.



# Chapter 6. Diagnostics

## 6.1. Monitoring Dashboard

### 6.1.1. { | @}

Monitoring Dashboard k Ür &³ m 3ÖP x" CD&' R' í %3 xm Ôs •³ m CD–! ) Š[ > O Æ„ 3=.

x ž J CD–! [ > ! =ĐF . =.

Node ~

a Ø3 Nodež Server +î Z õ [ > CD

] [ > P WX ĚMB W[ g e RI h, WASP „ • Function i j m R! •€ [ \ " €O&Ü • Ñ +î Z õ k ÜI J <` g e R=.

Monitoring Dashboard k Ür =ĐF . =.

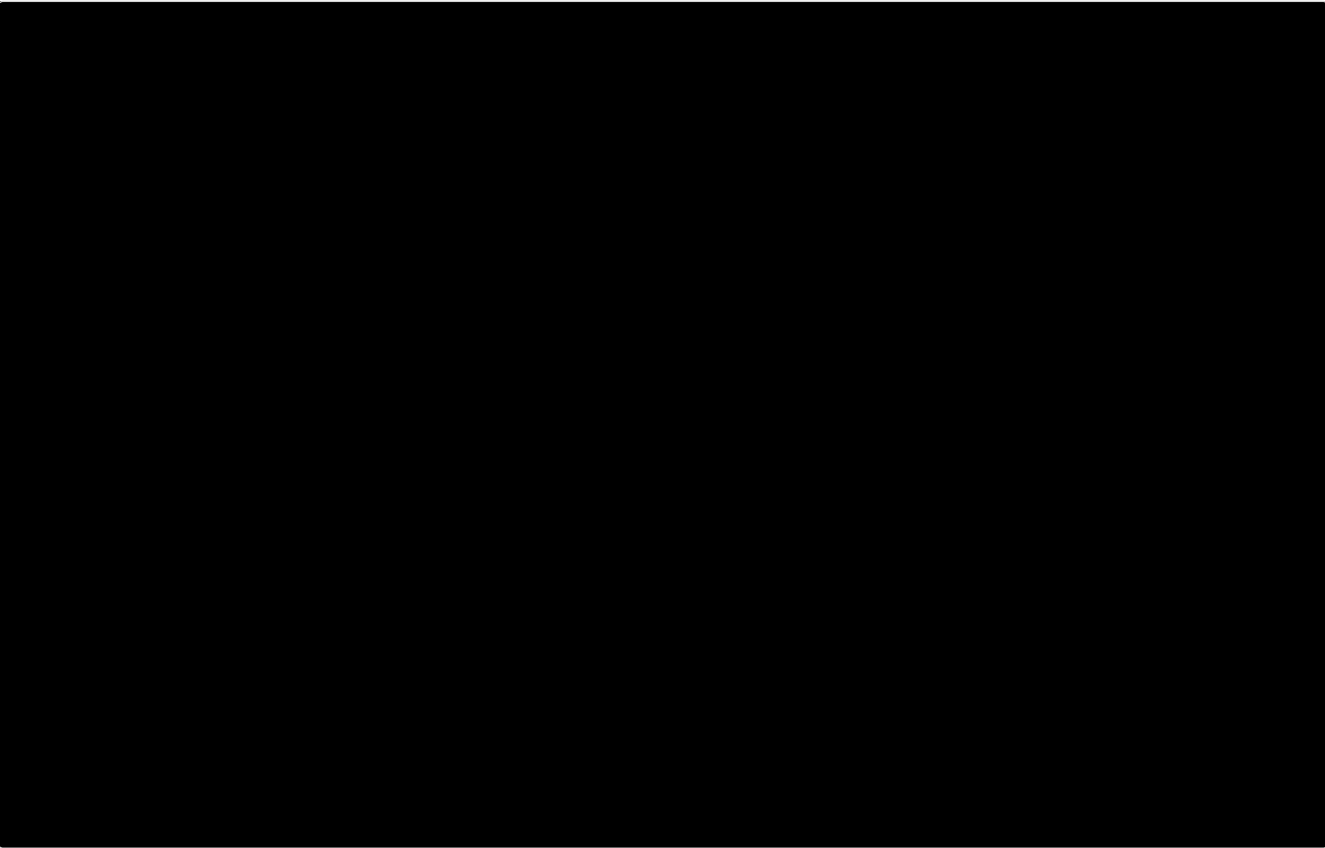


Figure 12. Monitoring DashboardP Node x k Ü

Monitoring Dashboard k Üm# ST3 «. 6r ÞBˉ . =. STG æþJ CD&! [ > P £• r Status Range «. " <TV Æ„ g e R=.( < æP &N æA +î Z õ Mú W[ ä' )

Table 39. Node • þ

VW	I J	X)
CPU	NodePCPU ST G	Default W[ ] r 60% 5i ) „ • Low, 80% <• ) „ • High<=.

VW	I J	X)
Memory	NodeP Memory ST G	Default W[ ] r 60% 5i ) „ • Low, 80% < • ) „ • High< =.
Disk	NodeP Disk ST G	Engine< WX3 Disk ST GJ Œ Default W[ ] r 60% 5i ) „ • Low, 80% < • ) „ • High< =.

Table 40. Application Server • p

VW	I J	X)
Status	Server M` z Y, Í ³ ¬F; f z Y(? • 8 MNO) \\ U` ¢êef z Y(G, MNO)	Unknown • p! Node AgentB GV #ç P • pB OQä e Ÿ! „ • m §² /
Server Name	Server < Y	
Heap Memory	Application Serverm# ST – ! Heap Memory ST G	
Thread Pool	Application ServerO PoolJ K L &! Request Thread ST G" Connector(Ajp, Http) ž J §²	
DataSource	Application ServerO PoolJ K L &! Datasource Connection ST G	

Table 41. Web Server • p

VW	I J	X)
Status	Server M` z Y	Unknown • p! Node AgentB GV #ç P • pB OQä e Ÿ! „ • m §² /
Server Name	Server < Y	
CPU	Web Server „ J Ñ%P CPU ST G	
Memory	Web Server „ J Ñ%P Memory ST G	
Thread	Web ServerP Thread e (Active / Max)	
Connected WAS	Web Server¬ __¬3 WAS [ > \ M` z Y	år £r [ p• p, ?Ø£r M` • p, ¬r £r ² %½\$Ym l ÷ &! #ç B P5

] #ç B V² C8g e R! M• " =ÐF . < 2Ó CD3=.

Table 42. Application Server C8 M•

VW	I J	X)
Thread Dump	Thread Dump < .	$f_{\text{„}} [ \setminus (\text{Server Snapshot(dump)}) >$ Dump List ÁÂ í % > Dump ( ) = ...J , O•
Active Service Dump	Active Service Dump < .	$f_{\text{„}} [ \setminus (\text{Server Snapshot(dump)}) >$ Dump List ÁÂ í % > Dump ( ) = ...J , O•
Heap Dump	Heap Dump < .	$f_{\text{„}} [ \setminus (\text{Server Snapshot(dump)}) >$ Dump List ÁÂ í % > Dump ( ) = ...J , O•
Forced Stop	$\# \zeta - C^a J$	$\Phi M^2 \wedge \ddot{Y} < V^2 - C^a J$
Forced Restart	$\# \zeta - C \div^2 \bullet$	$\Phi M^2 \wedge \ddot{Y} < V^2 - C \div^2 \bullet$



Figure 13. Dump I

!

Heap Dump, Thread Dump, Active Service DumpB <. &' =...J, g e R=. ) O@I J Dump! #çm# Out Of MemoryaP 9: , Thread PoolP F= ST, # \$ % p\_ a < ; < \* „ • " A ( æ" NV <. \* =.

<. &Û! Dump ŽEm Ōs Thread Dump [ \ , Active Service Dump [ \ , Heap Dump [ \ " €OV DumpB <. \* =. <. 3 Dump! Web Application ServerO I ÷ &! Hostã Tœ— ! ' , Thread Dump! {log\_home}/logs/tdump, Active Service Dump! {log\_home}/logs/sdump, HeapDump ( ) r Dump ( ) r {log\_home}/logs/hdump „ J m Tœ3=.

Delete [ \ " €O&z Dump ( ) " NCg e R=. Download [ \ " €OV Dump ( ) " =...J, g e RI h, =... J, ² VĪ Dump ( ) < ² %½ —¾ Dump ( ) F 2Ó zip æpJ =...J, 3=.

Dump KL kÜP à@r =ĐF . =.

Table 43. Dump k Ü à@

VW	I J	X)
File Name	<. 3 ( ) <Y	ç`B 1 2* f U• J U` <. 3=
Size	<. 3 ( ) P S<f	
Status	Dump e f ² ~ P System \ ServerP • p	Dump <. ² ~ P ² %½P CPU, Memory [ > \ Web Application ServerP Ě) L / % STĖ [ > t Dump <. ² 2Ó <. * =.  View [ \ " €O&z <. 3 Status ] " » Ag e R=

Table 44. Web ServerC8 M•

VW	I J	X)
Forced Stop	#Ç - C <sup>a</sup> J	¢M <sup>2</sup> ^ ¨ < V <sup>2</sup> - C <sup>a</sup> J
Graceful Stop	#Ç Graceful <sup>a</sup> J	



Monitoring [ > O §² - p q! =Ü aØ3 Node/ServerO >CJ I ÷ &! p, Node/Server<sup>-</sup> G- < İ -! • pAp HË\* =.

6.1.2. { | ...%† ‡ vw

Monitoring Dashboardm# Function i j m R! f 4^ [ \ (View Detail Chart) " í %&Ü • Ñ\* Thread, Memory, # \$% [ > B +î ZÖg e R=.

System %

Web Application ServerP Memory, Thread, Service [ > B » Ag e R=.

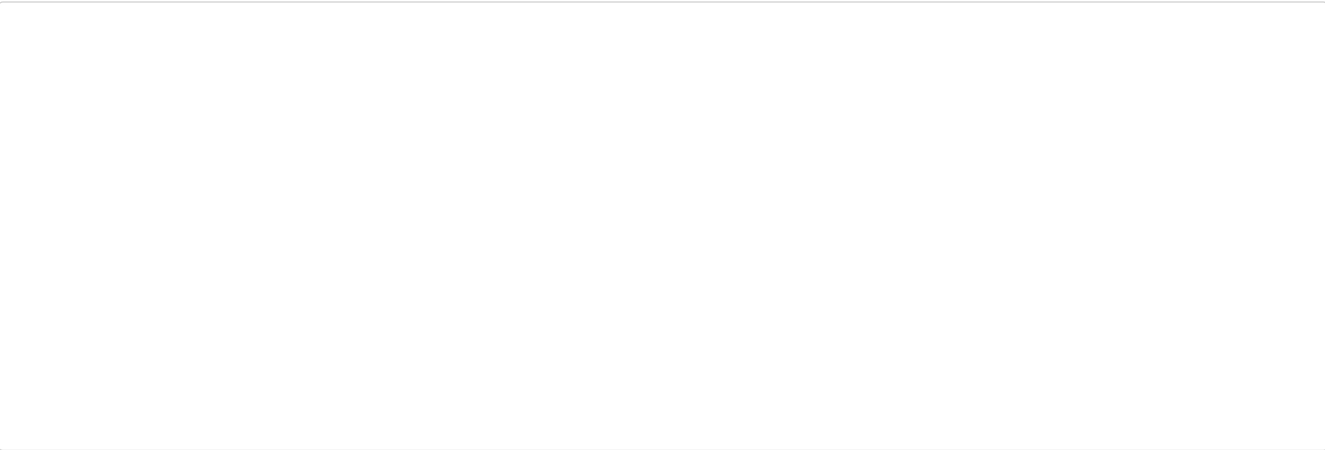


Figure 14. System x

Memory Chart

>² ^ Memory STÎ [ > O §² 3=. CD&! [ > J! GC Time(Garbage Collection / ) ² ^), GC Count, Heap Used(Total Memory - Free Memory), Total Memory(#Ç m# ST¼A é Á+L)O R=. oÚP âr ~ í r ST O• \* é¢ Heap MemoryB P5\* =. Ös# oÚm# Heap Memory STÎ < ) O@A GCOx< Þb è ² ^` . \_«@I J âr ~ í m ÄÃg „ • âPVÝ \* =.



Request ThreadP é¢] r Server ÁÂm# Vİ Web Application ServerP maxThreads « . " GV Æ„ g e R=.

Thread Chart

Web Application ServerO STUP ) + " üL&M NV Pool J KL&' R! Request Thread ST —¾" y e R! Line Chart<=. oÚP âr ~ í r STg e R! Request ThreadP é¢XB P5\* =. ùf m oÚm# Request Thread eO âr ~ í m ÄÃg „ • âPVÝ \* =.



Request ThreadP é¢] r Server ÁÂm# Vİ Web Application ServerP maxThreads « . " GV Æ„ g e R=.

Thread List

Web Application ServerP +, ThreadB » Ag e R=. ~P3 Thread <Y<° Thread • pB M'' I J  
( Zõ g e R=. Thread ListP à@r pB^- . =.

Table 45. Thread List à @

VW	I J	X)
Thread ID	' å Thread ID	
Name	Thread < Y	
Stat	Thread • p	é Ñ OpP • pO I ÷ 2  ¥ RUNNABLE: OT Thread  ¥ WAITING: = ' ThreadP K[ Action " ef &M NV ¢M ¼A Thread  ¥ TIMED_WAITING: Ò² 3 ¢M² ^ < R! Thread
CPU	p [ 3 Threadm ¢ * CPU ST² ^	
Tx Id	Úèì ; ID	
Elapsed	ThreadO ef – ! ' de ² ^	
Service Name	ThreadO ef * # \$% < Y	

+ [ \ " í ® =ÐF . r • Ñ [ > B » Ag e R=.

Table 46. Thread • Ñ [ > à @

VW	I J	X)
threadId	' å Thread ID	
threadName	Thread < Y	

VW	I J	X)
State	Thread • p	é Ñ OpP • pO I ÷ 2  ¥ RUNNABLE: OT Thread  ¥ WAITING: = ´ ThreadP K [ Action " ef &M NV ¢M ¼A Thread  ¥ TIMED_WAITING: Ò² 3 ¢M² ^ < R! Thread
threadCpuTime	—÷ ThreadB 1 2* +, ThreadP CPU ² ^	
threadUserTime	—÷ ThreadP CPU ² ^	
blockedCount	Block3 HI	
blockedTime	Block3 Ì @ „ F ² ^	
waitedCount	¢M* ThreadP HI	
waitedTime	¢M* ThreadP Ì @ „ F ² ^	
lockOwnerId	lock3 ObjectB / å * ThreadP ID	
lockName	lock3 Object < Y	
lockOwnerName	lock3 ObjectB / å * ThreadP < Y	
stackTrace	stackTrace	

Active Service List

# \$% [ > \ VÍ # \$%B üL&' R! Thread [ > B » Ag e R=. VÍ [ > ã à@r Thread  
List à@F åS&h, =ÐF . r ÇO à@< I ÷ \* =.

Table 47. Active Service List à @

VW	I J	X)
Sql	—÷ ef ¼A SQLf	

DataSource %

Application Serverm W[ 3 DataSource [ > B » Ag e R=.



Figure 15. DataSource x k Ü

DataSource Chart

Active Connection e Idle Connection eO Chartm >^ I J §^ 3=. oÚP år ~ í r W[ 3 éΦ Connection eB P5\* =. Active ConnectionsO år ~ í m ÄÃg „ • åPVÝ \* =. î > â %m# DataSourceB í %&z = DataSourceB +î Z õ g e R=.



éΦ Connection e! DataSource [ > aØk ÜP maxConnection « . " GV Æ„ g e R=.

DataSource Information

p[ \* DatasourceP W[ [ > B » Ag e R=.

6.1.3. ...%† ‡ I ]

DIAGNOSTICS > Policy > Common Rule Setting ÁÃm# +î Z õ Mú W[ " g e R=. W[ à@r =ÐF . =.

Table 48. +î Z õ K{ Mú W[ à@

VW	I J	; ga
Status Range	Monitoring Dashboard m# ResourceP Low, Middle, High M´´ " W[ * =.	60% 5i ) „ • Low, 60% <• ) „ • Middle, 80% <• ) „ • HighB P5* =
Diagnostics Interval	Í ³ ËMB W[ * =.	10000(ms)
Dump Limit	] #ç P Dump(Thread/ActiveService/Heap) s t uL ž Dump Ōe C* (0r • C* " P5)	200(Ö)



# Chapter 7. Topology

] ² %½P - . —¾" \* ° m a Þ y e R l h, W X \ W [ M • " C D & ' , U " + î Z õ \ M ` /¼p C8B g e R =.



Figure 16. Topology k Ü

## 7.1. : x ?,

System † û, u • J p † û, U " + î Z õ † û l J - & 3 =.

¥ System † û

a Ø 3 System L %Ú B Í , æ þ J C D \* =.

Í , ã P ² %½ Ò 56P Þ < ï r ² %½ P • þ B P 5 & ! ' • þ B § ² & ! M ¨ r ² %½ " - . & ! Resource ¯ Í ³ ¬ F m Ô s 3³ l J ° Ò 8 ° Ž • =.

è q Š < Æ MNO : ² %½ " - . & ! + , # Ç P U " S T Î < Low A „ •

è B | < Æ MNO : ² %½ " - . & ! + , # Ç P U " S T Î < Middle A „ •

è • Ž < Æ MNO : ² %½ " - . & ! ) Y # Ç P U " S T Î < High A „ •

² %½ Ò & ³ P • • MNO r ² %½ ã P WAS6P ñ ò ê ™ ² ^ " P 5 & ' , ' ' " MNO r — ÷ S T U e ( é Ä 5 & ` · ) / 9 Ê ¡ H S T U e B P 5 \* =.

!

U " S T Î P Low, Middle, Highm Ç \* M ¨ r DIAGNOSTICS > Policy > Common Rule Setting > Dashboard à @ m # Æ „ g e R =.

¥ u • J p † û

² %½ Ž ^ , ¯ # Ç Instance - . —¾" u • J p o Ú J > z ¨ =. ] Nodem W X \* WEB Server ¯ WASB > f g e R ' , # Ç • þ [ > B » A g e R =.

!

¥ U" +î Z õ † û

Node ServerP CPU, Memory a • Ñ U" +î Z õ [ > B CD\* =.

² %½@Ø • 6m R! I ] [ \ " GV =DP Sà" Æ„ g e R=.

Chart

¥ Refresh Interval : u • J p † û P ' < Z WX Ë M

¥ Refresh Topology Chart : u • J p † û P oÚ ğ L! ÁŽ' <Z [ H. – § \ μ"

System List

¥ System @Øm > z œ System í % \ " # Æ„

Elements

¥ Show Endpoint : Endpoint † û §² z Y W[

¥ Show Edge Info : Edgem • Ñ[ > §² z Y W[

¥ Show Server Name : ServerØ §² z Y W[

Transparency

¥ Node : u • J p † û P Node óÒt B W[

¥ Edge : u • J p † û P Edge óÒt B W[

## 7.2. " • t c 5– v w

u • J p m# ô +, m Ôs [ > B - &&z > z `` =.

¥ View All : ĵ H [ > B > z `` =.

¥ Low : #ç P U" STÎ < Low A A%×%i - &&z > z `` =.

¥ Middle : #ç P U" STÎ < Middle A A%×%i - &&z > z `` =.

¥ High : #ç P U" STÎ < High A A%×%i - &&z > z `` =.

¥ Stop/unknown : ¼p 3 A%×%i - &&z > z `` =.

### 7.2.1. Control

E2E (End to End)K ~ &m ClientY Z DatabaseÉ p • Ñ\* +î Z õ [ > \ C 8 M• " CD\* =.

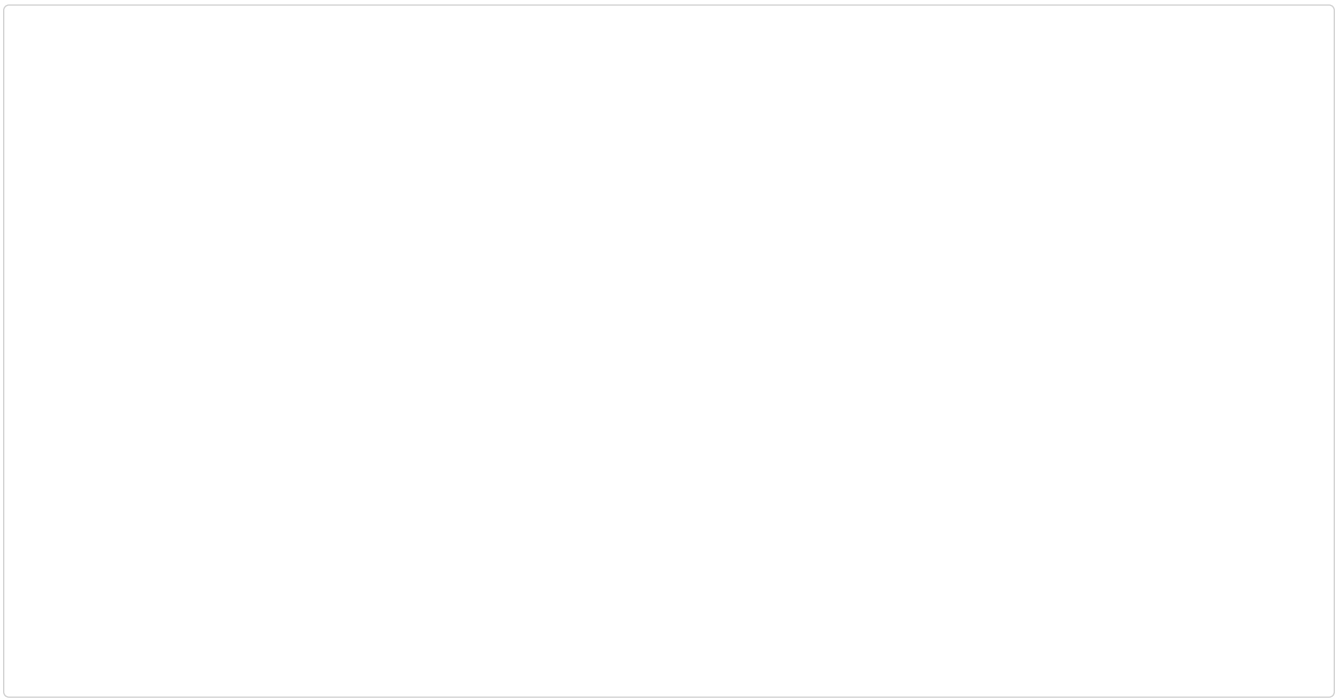


Figure 17. Topology Control

## CLIENT 5–

Client! STUB õ&h, STUO Web#çm ) + " È' , ! ös • T k Ü Rendering <sup>2</sup> ^ \ Script error ã T " » A g e R =.

## WEB 5–

WEB † ûm#! WX3 WEB Node <sup>-</sup> WEB #ç [ > B CD&' #çP C8 g eR =.

¥ - . [ >

Web Node! Web #çO WX–! † ûl J ^ , ž #ç WX —¾" » A g e R =.

¥ +î Z õ [ >

Web Nodem#! Mú@l J CPU, Memory, Disk • p [ > B CD\* =.

Web Serverm B• %B } = ¢Ü k ò æpJ #çP CPU, Memory, Thread • p [ > B CD\* =.

Web Node<sup>-</sup> ServerB í %&Ü u • J p † û • 6m R! U" +î Z õ † ûm ] ] P ><sup>2</sup> ^ • Ñ +î Z õ [ > O CD3 =.

è Node : CPU, Memory, Disc, Network<sup>-</sup> Mú [ >

è Server : CPU, Memory, Thread, QoS<sup>-</sup> Mú [ >

!

^ , • <sup>3</sup> P Ž < ÷ ( ^ , Ò § <sup>2</sup> 3 † û ) p „ Èr ^ , • m R! #ç 6P • p  
¼ Oœ Critical\* £l J ° Ž m = . , B 68 ^ , • m 3¢P #çO R! ' ¿  
¼ \* ¢O High • p < Ü (= ´ #ç 6P • p! Middle | ! Low) ^ , P Ž < ÷  
p „ Èr HighB P5&! £l J § <sup>2</sup> \* =.

¥ C8 M•

Serverm ¢V Èd 3Op C8 M• " CD\* =.

1. Server Control : Start, Stop, Service Control

!

Service Controlr • ¼³ @² p1 M• " CD\* =. <ýr 9: # \$ % ; <²  
<B e[ \* /%B WASm êø p1&' < WASB š~ g Web  
#ç (@² #ç)B - . \* Q 9: O ; <3 # \$ % B ) + , r Web #ç 6<  
@² #ç J # \$ % B 1 > " & z # \$ % O [ • @I J CD-d &! ñ | <=.

C8² ^, C8Wà (Header, Cookie, URL) \ ) + " forwarding g #ç B [ P Q  
Tœ&Ü [ P 3 ãTm Ôs >² ^I J 689! ) + " VÍ #ç J \_¬&z  
#ç ÷M` Ý< # \$ % B CD\* =.

## 2. Move to : Configuration

### APPLICATION 5-

APPLICATION †ûm#! WX3 WAS Node¯ WAS [ > B CD&' #ç P C8 g eR=.

¥ - . [ >

WAS Node! WASO WX-! †ûI J ^, ž #ç WX —¾" » A g e R=.

¥ +î Z õ [ >

WAS Nodem#! Mú@I J CPU, Memory, Disk • p [ > B CD\* =.

WAS Serverm B• %B } = ¢Ü k ò æpJ #ç P CPU, Thread, Heap • p [ > B CD\* =.

WAS Node¯ ServerB í %&Ü u• J p †û • 6m R! U" +î Z õ †ûm ] ] P >² ^ • Ñ  
+î Z õ [ > O CD3=.

è Node : CPU, Memory, Disc, Network¯ Mú [ >

è Server : Warning, CPU, Memory, Thread, QoS¯ Mú [ >

!

^, • ³ P Ž<÷(^, Ò §² 3 †û) p„ £r ^, . m R! #ç 6P • p  
¼ Oœ Critical\* £I J ° Žm=. , B 68 ^, . m 3¢P #ç O R! ' ¿  
¼ \* ¢O High• p<Ü(=´ #ç 6P • p! Middle | ! Low) ^, P Ž<÷  
p„ £r HighB P5&! £I J §² \* =.

¥ C8 M•

Serverm ¢V Èd 4Op C8 M• " CD\* =.

1. Server Control : Start, Stop, Forced Stop
2. Manual Check : Thread Dump, Active Service Dump, Heap Dump, Dump List
3. Move to : Configuration, System, Datasource

### DB 5-

DB †ûm#! WAS¯ \_¬3 Database [ > B CD\* =. Database! RESOURCE ÁÂm# aØ-8  
R8Ý \* =. ^, ! =´ †ûFP ` ) &d §—&M NV O• P ^, J §—&' R=. ] DBm ¢\*  
+î Z õ [ > ° C8 M• r CD&p q! =.

Edge ] /

\_¬í r ] A%×% ^, | ! A%×%¯ Database^P \_¬" P5&h, \_¬3 Connection eB  
° Ž• =.

¥ Client-WEB : Connection e

¥ WEB-APPLICATION : Active Connection e

¥ APPLICATION-DB : Active Datasource ST G (%)

End to End +î Z ÕM• r Mú@l J off• þJ W[ – 8 R=.

Ôs# Client-WEB, WEB-APPLICATION S<P ös• T ù} õ ñòê™² ^ | !  
ServerP ñòê™² ^" > M NV#! =ÐP " #¢J W[ " VË8Ý\* =.

1. manager.conf ( ) m# diagnostics.e2e.enable=true J W[

2. web serverP httpd.conf ( ) m# httpd-eum.conf ( ) Ë ú VC

```
<IfDefine MOD_EUM>
Ë #LENA E2E Monitoring Extension settings
Ë Include ${INSTALL_PATH}/conf/extra/httpd-eum.conf <-- <Y&
Ë ú VC
</IfDefine>
```

3. web serverP eum/eum.properties( ) m# agent\_enable] " trueJ e[

E2EW[ " û Q \_¬í m CD–! [ > ! =ÐF . =.

¥ Client-WEB : Connection e(Client ös• T ù} õ ñò ~ J ² ^ (ms)/Web  
Server ñòê™² ^ (ms))

¥ WEB-APPLICATION : Active Connection e(WAS ñòê™² ^ (ms))

¥ APPLICATION-DB : Active Datasource ST G (%)

# Chapter 8. Admin

## 8.1. IAM

ManagerP STU KL \ STU ž ÁÂ Å\* KL M• " CD\* =.

### 8.1.1. Users (' ' " 1 2)

' ' " WY

ADMIN > Users ÁÂm# Manager STUP <. ,e[ ,NC M• " CD\* =.

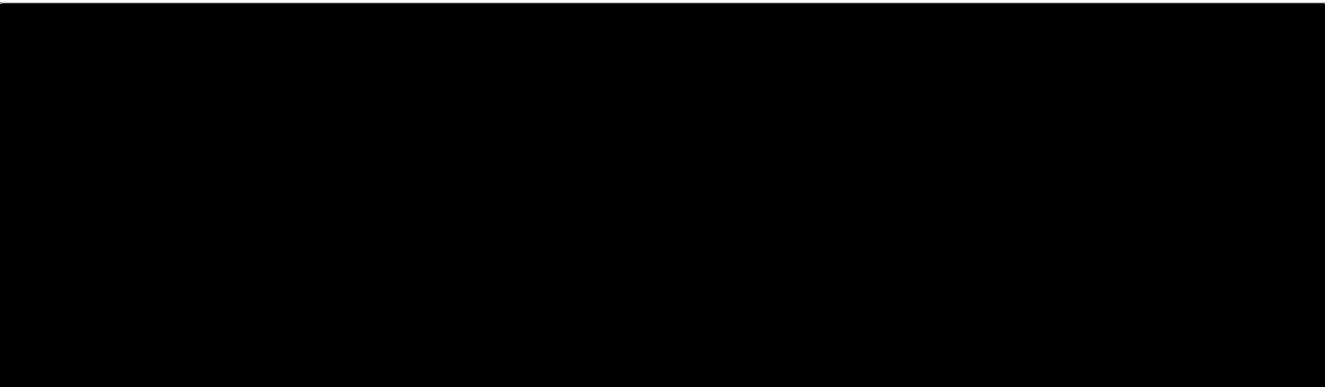


Figure 18. Users k Ü

STU KLP «. r Þ³´ . =.

Table 49. STU KL «.

VW(*! _Ra)	I J	X)
Use ID(*)	STU   ž U	
User Name(*)	STU <Y	
Password(*)	STU \$ĩ 8š	\$ĩ 8š! Kef U, üU,†fU ýHP é/ 8U <• <8Ý * =
Updater	STU ' <Z e[ \ <. U	
Last Update	STU ' <Z e[ \ <. ) U	
+ MNO	New [ \ ,R] [ \ " €O&z í %3 Å* [ > OÆ„ ¼\ " §²	
- MNO	` = [ \ " €O&z í %3 Å* [ > O NC/ " §²	

!

Mú@I J KLU Å\* " OÍ I [ " É Õ CD\* =.(\$• T) CD–! I [ \$m  
STUB ÇO&z ST&MB Åæ\* =.

' ' " ZY

1. New [ \ " €O&z - » STU aØ" `` \$\* =.

2. STUID,STU Ò,STU O%>, BEP\* =.

è STU O%>, ! | šk-8 Tæ3=.

è O%>, ! | pUeO8~20U,†8 ¢/f U,üU,Kef U(!@#\$\$%^\*+=-) WHI J • . \* =.

3. Save [ \ " €O&z STU [ > B Tæ\* =.

!

¥ Password | šk! Vÿ a' L- (SHA-512)" ST\* =.

' ' " R]

1. e[ g STUB í %\* =.

2. R] [ \ " €O&z STU Ò,STU O%>, B Æ„ \* =.

è STU O%>, ! | šk-8 Tæ3=.

3. Save [ \ " €O&z STU [ > B Tæ\* =.

!

¥ Manager m J ¿ A² 7 8 <• >O&Ü Vİ P<s! ! " • pO-8 STg eO  
ÿ=.

¥ ! " • pB VC&M NV#! STU KL kÜm# Vİ P<sP O%>, B  
e[ VË8ÿ \* =.

¥ O%>, e[ " NV Manager m J ¿ A \* I [ < ÿ! „ • m! ,  
\$LENA\_HOME/bin/reset-manager-pw.sh B >f &z O%>, B e[ g e R=.

' ' " ` =

1. NCg STUB í %\* =.

2. ` = [ \ " €O&z STUB NC O• \* • pJ Æ„ \* =.

3. Save [ \ " €O&z STU [ > B Tæ\* =.

!

STUO1Ò Òr „ • ! NCg e ÿ=.

### 8.1.2. Auths (—~ 1 2)

Manager! ÁÂ ž Å\* KLB NV Å\* ¿ M" <. VÝ \* =. ADMIN > Auths ÁÂB GV Å\* ¿ M"  
<. , e[ , NCg e R=.

—~ WY

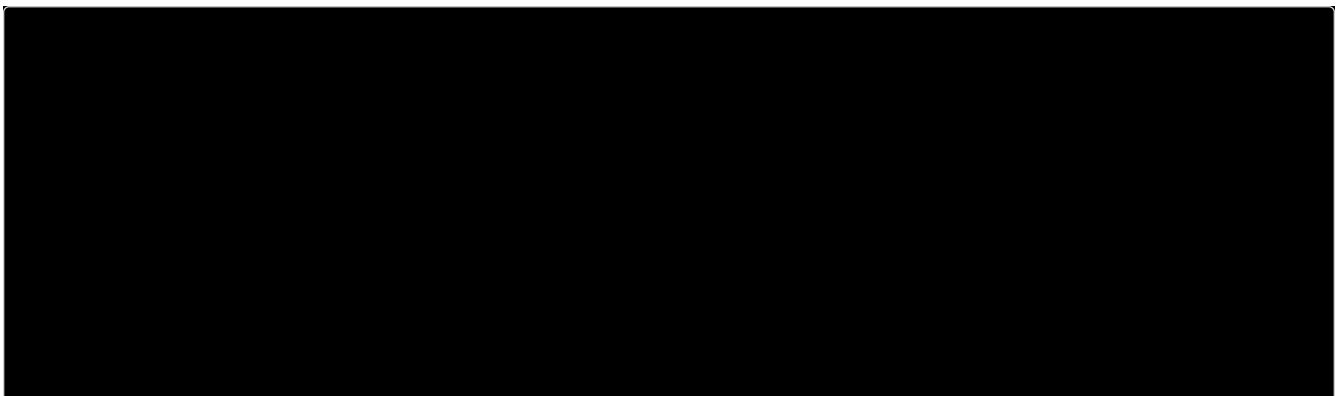


Figure 19. Auths k Ü

Å\* KLP « . r Þß<sup>-</sup> . =.

Table 50. Å\* KL « .

VW(*! _Ra)	I J	X)
Auth ID(*)	Å*   ž U	
Auth Name(*)	Å* <Y	
Description	aØ3 Å* m ¢* WÒ	
Updater	Å* ' <Z e[ \ <. U	
Last Update	Å* ' <Z e[ \ <. ) U	
+ MNO	New [ \ , R] [ \ " €O&z í %3 Å* [ > O Æ„ ¼\ " §²	
- MNO	` = [ \ " €O&z í %3 Å* [ > O NC/ " §²	

—~™,

1. New [ \ " €O&z - » Å\* aØ" `` \$\* =.
2. Å\* ID, Å\* Ò, Å\* WÒ" EP\* =.
3. Save [ \ " €O&z Å\* [ > B Tæ\* =

—~R]

1. e[ g Å\* " í %\* =.
2. R] [ \ " €O&z Å\* Ò, Å\* WÒ" Æ„ \* =.
3. Save [ \ " €O&z Å\* [ > B Tæ\* =.

—~` =

1. NCg Å\* " í %\* =.
2. ` = [ \ " €O&z Å\* " NC O• \* • þJ Æ„ \* =.
3. Save [ \ " €O&z Å\* [ > B Tæ\* =.

8.1.3. User-Auth Mapping (‘ ’ “ —~ 1 2)

Manager STU! ÁÂ ST Å\* #y" NV é/\* 1ÕP ¿Mm /«-8 R8Ý \* =. KLU! Å\* ¿M" í %&z STUB p«² g e R=. "Å\* KL" kÜ" GV aØ\* Å\* ¼ &° B í %&' z ® \$q ç<sup>-</sup> " ST&z STUP Å\* " C8\* =.

‘ ’ “ —~š>





Figure 20. User-Auth Mapping k Ü

STU Å\* KLP « . r Þβ<sup>-</sup> . =.

Table 51. STU Å\* KLP « .

VW	I J	X)
Å* Ò í %	"Å* KL" k Ü" GV aØ* Å* L%ÚJ - . 3 î > â %	
ID	STU   ž U	
Name	STU <Y	

' ' " —~ œ•

- STUB p«<sup>2</sup> g Å\* " í %\* =.  
è Å\* í %<sup>2</sup> í % O• STU<sup>-</sup> í %3 STU O k Üm ~P3=.
- í % O• STUB í %\* =.
- STUB p«<sup>2</sup> Sn° C\$<sup>2</sup> ã =.  
è ž r Ÿ í ϕ [ \ " €O&z í %\* STUB p«<sup>2</sup> ã =.  
è £ ¤ Ÿ í ϕ [ \ " €O&z +, STUB p«<sup>2</sup> ã =.  
è ž r ¥ í ϕ [ \ " €O&z í %\* STUB C\$<sup>2</sup> ã =.  
è £ ¤ ¥ í ϕ [ \ " €O&z +, STUB C\$<sup>2</sup> ã =.
- Save [ \ " €O&z STU Å\* KL [ > B Tœ\* =.

8.1.4. Menu-Auth Mapping (| § —~ 1 2)

LENA Managerm# <. \* Å\* ž J ÃÄ O• \* ÁÂB W[ g e R=. Å\* í %" GV <. \* Å\* ¼  
ÁÂB W[ g &° P Å\* " í %\* =. LENA Managerm aØ3 +, ÁÂB > z È! ÁÂ @Ø ¼ ÃÄ  
C8B W[ g ÁÂB í %&' ÁÂÅ\* " W[ \* =.

| § —~ š>

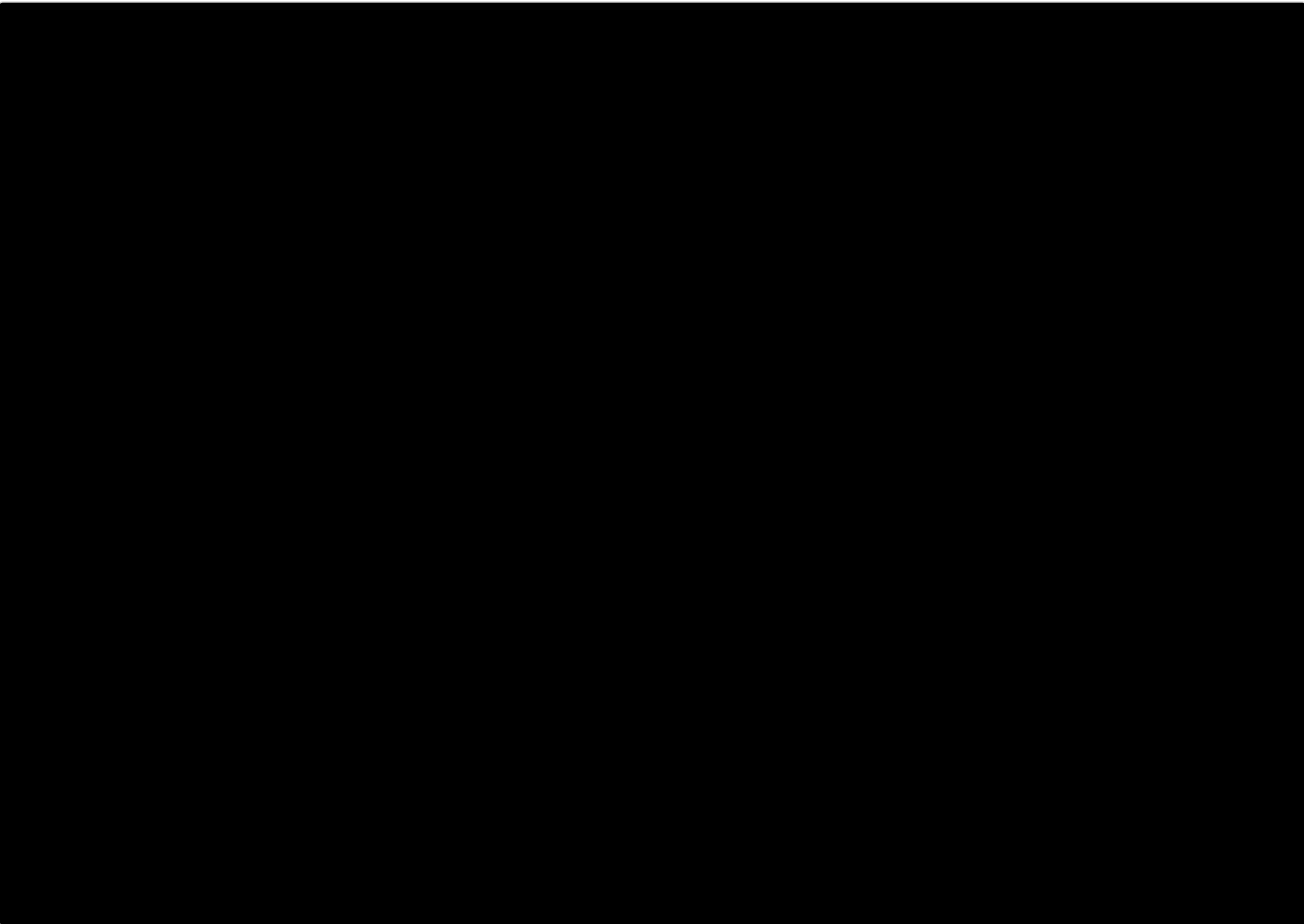


Figure 21. Menu-Auth Mapping

ÁÂ Å\* KLP «. r Þβ<sup>-</sup> . =.

Table 52. ÁÂ Å\* KLP «.

VW	I J	X)
Å* Ò í %	"Å* KL" k Ü" GV aØ* Å* L%ÚJ - . 3 î > â %	
Menu Name	LENA Managerm aØ3 ÁÂ ¼ 56 ÁÂ @Øm# í %* ÁÂ <Y	
Auth	í %* Å* P ÁÂÃÄÖ• z Y §²	Default "N"

!

"SERVER", "RESOURCE" ÁÂP &N k Üm# Node, Server, Resource " ÇOg „ •  
U` I J "ÁÂ Å\* KL" k ÜP ÁÂ @Øm ÇO\* à@< WX3=.

Ôs# - » ÁÂB ÇO&' Ç" „ • "SERVER", "RESOURCE" &N k Üm# ]  
à@" aØ \ <. &Ü 3=.

! § —~ œ•

1. Å\* " W[ g ÁÂB í %\* =.  
è Å\* í %² ÁÂm Ç\* Å\* Ép WX3=.
2. ÁÂ @Øm# Å\* " W[ g ÁÂB í %\* =.  
è ÁÂ í %² ÁÂ Å\* @Øm ÁÂ Å\* < §² 3=
3. Å\* Æ„ < ( ) g „ • Y{ r N" í %\* =.

4. Save [ \ " €O&z ÁÃ Å\* [ > B Tœ\* =.

## 8.2. License

ManagerB GV ] Nodež —÷ @T3 s<í %B WX&' %- g e R! M• " CD\* =.

### 8.2.1. License WY

Licensek Ü" • Ü Nodež J —÷ @T3 LicenseP @Ø" WXg e R=.

LicenseP • p! Status à@" &' > Ü » A g e R=.

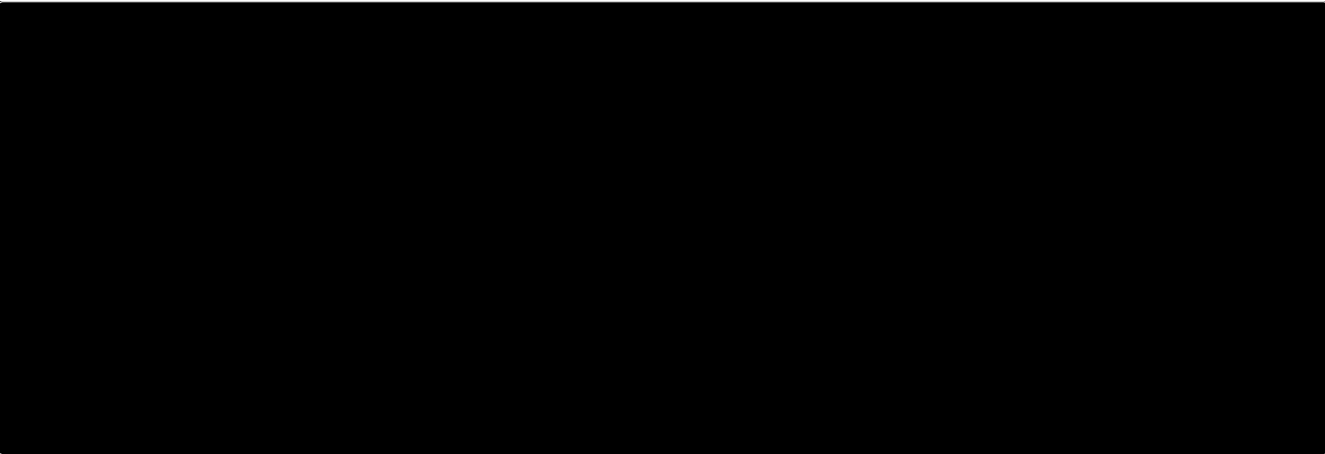


Figure 22. LicenseP @Ø k Ü

### 8.2.2. License v w

LicenseP @Ø" €O&Ü LicenseP • Ñ [ > B » Ag e R=.

• Ñ [ > à@r Þß<sup>-</sup> . =.

Table 53. LicenseP • Ñ [ > à@

VW	I J	X)
Node Name	Node Ò	
Type	s<í %- &	Trial, Standard
Customer Name	- á ' ( S Ò	
System Name	WX3 ² %½ Ò	
Issue No	s<í % ; f 8Š	
Issue Date	s<í % ; f ) U	
License Term	s<í % ' T M^	
Engine Path	LENA Engine WX „ J	
IP Address	NodeP IP Ě /	
Hardware ID	H/WB A   &! ID	MAC Address   ! HostÒ

VW	I J	X)
Contract CPU Core Limit	I Š3 é¢ Core Õe	
CPU Core Limit	>C 6[ 3 Core Õe	
Contract Instance Limit	I Š3 é¢ InstanceÕe	
Instance Limit	>C 6[ 3 Instance Õe	
Status	s <í % å" . z Y	



s <í %P i J M^ 15) i YZ a) ÁÑpB CD\* =. a) ÁÑp! Manager • 6  
• ³ P " MNO m# » A g e R=.

8.2.3. License €t © / ª ?

€t ©

^ , @Øm# - » License B @T&' U &! ^ , B í %&' @Ø &³ P Upload [ \ " ST\* =. Vİ ĸ " €O&Ü License òJ , k òI < • L! ' < I m# ; ø, r License ( ) " ½P òJ , &Ü í %\* ^ , 6m LicenseO @T 3=.

ª ?

^ , @Øm# License B µ- &' U &! ^ , B í %&' @Ø &³ P Restore [ \ " ST\* =. Vİ ĸ " €O&Ü ~òV É' \* ( ) J LicenseO µ- 3=.

8.2.4. License 1 « • ¬ - { | ¤ ®

License @ØWX k Üm# NodeB í %&' Check System Info [ \ " €O&Ü, License ; øm ( ) \*  
² %½ —¾" » A g e R=.



Figure 23. System Information

```

CLI# m# t ] NodeŽ License —¾" WX&M N* Shell ScriptB CD* =. Shell ( ) r
${LENA_HOME}/bin/check-license.sh < =. < ScriptB > f * ¬FP SD! ÞB¬ . =.

```

check-license.sh > f ,

```
[bi n]$ ./check-l i cense. sh
*****
[System Information]
Ê Hostname : solweb2
Ê HostAddress : 127.0.0.1
Ê Hardware ID : 52:54:00:E9:AC:A1 ( 52:54:00:E9:AC:A1 )
Ê Engine Path(LENA_HOME) : /engn001/l ena/dev
Ê Node UUID : e46da220-db50-3854-84a0-7b61e1b6e7cd
Ê CPU Core : 4
Ê HyperThreading : DI SABLED
Ê Current Date : 20180705

[License Information]
Ê License Status : true [License is valid.]
Ê ISSUE_NO : 201807041532438300001
Ê TYPE : Standard
Ê CUSTOMER_NAME : LG
Ê SYSTEM_NAME : CNS
Ê SYSTEM_TYPE : PROD
Ê HARDWARE_ID : 52:54:00:E9:AC:A1
Ê LENA_HOME : /engn001/l ena/dev
Ê CONTRACT_CPU_CORE_LIMIT : 8
Ê CPU_CORE_LIMIT : 8
Ê CONTRACT_INSTANCE_LIMIT : 8
Ê INSTANCE_LIMIT : 8
Ê START_DATE : 20180501
Ê END_DATE : 20190531
Ê LI CENSE_KEY :
H2VaDEE9fj FI vHBRsQeGXasYT5I 4tBc6ebayNI dtVZ5/I j 4/EMOmYf38karMTKgCllmPMMFa8B0EFt
5zRfBc/I i 0xI mDgy
j 0+i q30ABfJoyAhY3nWBVJhBy7h0U3hzJWr1hyCuZMFAHquL4di nwWAqmJeL+j ntJKFufD38vdF2Yw
KEoRNH9dGQnqXZH0
U8wQZmN4UHK5YB5/06YI UffNGU3wyzj fKCfF9GoI u9zQAsSZ358ptj C/TBUy+ccvLa75H32XPxi NSS
xytn0hGFbcVc61kv
zi 7YMNUGnuEyDEQ/dhFKxJ17i j UQBZj 5xbFQ9qUTzL1QKGLI +cbYVsr6kvZg==
*****
```

~P~! à@r + æm#P WÖF ` ) &h, License ; øm ( ) \* MÚ[ > B ~P& J License ; ø  
) + ² m z T 3 =.

!

~P à@ ¼ "HyperThreading" r HyperThreading STz YB HÈ&! ýI J ,  
HyperThreading ST ² òL CoreP 2peJ Coree B €[ \* =.

### 8.2.5. Host; ~ License æ® I ]

License! I Šm Ôs Mac Address |! HostÒI J ; ø¢• H/WB HÈ\* =. MÚ W[ r Mac  
Address M" < J , HostÒ M" I J License HÈB > f &M NV#! Linux/Unix OSB M" I J

```

${LENA_HOME}/binm NX* start-agent.sh, check-license.sh( ) F ] Application ServerP setenv.sh
( ) " • 8# =DF . < e[ * =.

```

```
start-agent.sh ( ) W[ (Æe $JAVA_OPTm ÇO)
```

```
JAVA_OPTS="$\{JAVA_OPTS} -DI i cense. check-type=hostname"
```

```
check-license.sh ( ) W[ (=Ð à@ Ě ú VC)
```

```
_JAVA_OPTS="$\{_JAVA_OPTS} -DI i cense. check-type=hostname"
```

```
] Application ServerP setenv.sh ( ) W[ (=Ð à@ Ě ú VC)
```

```
CATALINA_OPTS=" $\{CATALINA_OPTS} -DI i cense. check-type=hostname"
```

## 8.2.6. • ° ] / Š>

```

s<í % @Øm# ² ^[ > B WX&' Φr ^, B í % Q, Check Time Info [ \ " €O&Ü í %*
^, 6m Φ* ² ^F Ž\I P [ > B »A g e R=.

```

## 8.3. Security (n X ¬ = ±)

```
Application Serverm IP! ! URLMOI J STU ) +" C* &! M• <=.
```

### 8.3.1. Rule Setting (Rule I ] )

```

K[ IP° URLm# ) +" C8&' Φr „ • k Ü" GV - » Rule" W[ * =. - » Rule W[ \ Rule
NCP ĖP. " CD&M NV –fM• " CD* =. j H Applicationm @T–! Server« . r
m®4<pJ üLg e R=

```

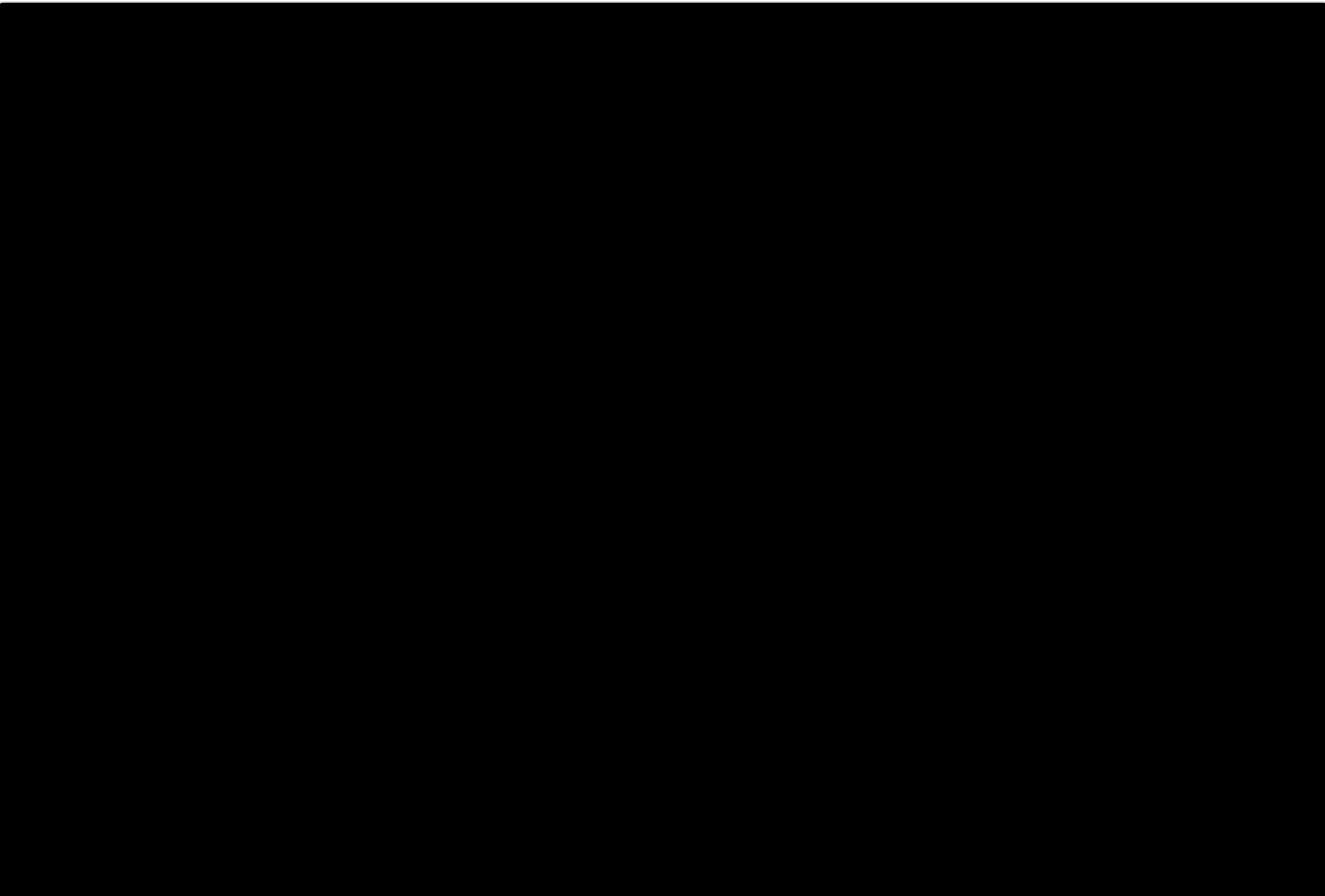


Figure 24. Rule Setting k Ü

!

Rule @ØP Use i j r Vİ Rule< Application Serverm @T– 8 R! p z YB ° Ž• =.

Rule ÇO² W[ O• \* «. r ÞB⁻ . =.

Table 54. Rule ÇO² W[ O• \* «.

VW(*! _Ra)	I J	X)
Rule Name(*)	ÇO&! RuleP < Y	
Description	ÇO&! Rulem ¢* WÒ	
Rule Type	C8g ³ N	IP, URL
Allow IP(*)	' Og ) + IP	[ »   æþJ EP O•
Deny IP(*)	nYg ) + IP	[ »   æþJ EP O•
Control Time(*)	Rule" @Tg ² ^³ N	
Error Message(html)(*)	C8J AV Filtering3 ) +m ¢* ~Pg m® 4<p	

!

C8â æ< "IP with DateTime"A Rulem Proxy ServerJ ¼I –! Application Server B @T\* =Ü, Proxy ServerP > . @ K. I J AV User IPB - g e Ý8 Rule @T< –p q" e R=.

!

<. 3 Rule ¼ @T 3 Ruler NC g e Ý=.



8.3.2. Rule Applying (Rule 2 ' )

ÇO3 Rule ¼ &° B í %&z Application Serverm @T \* =. @T ĲP. " NV Ruleå æ, @T ³ N, RuleÒm ¢ \* – ĲM• " CD\* =.

Rule @Øm# &° B í %&z Rule @Tm# \$q ç ¨ 6" <T&z @T ¢• " í %&' , On/Off [ \ " ĲO&z @T \ Tœ\* =. @T ¢• m# C\$B &' ¢" „ •mt \$q ç ¨ 6" <T&z C\$² ā =.

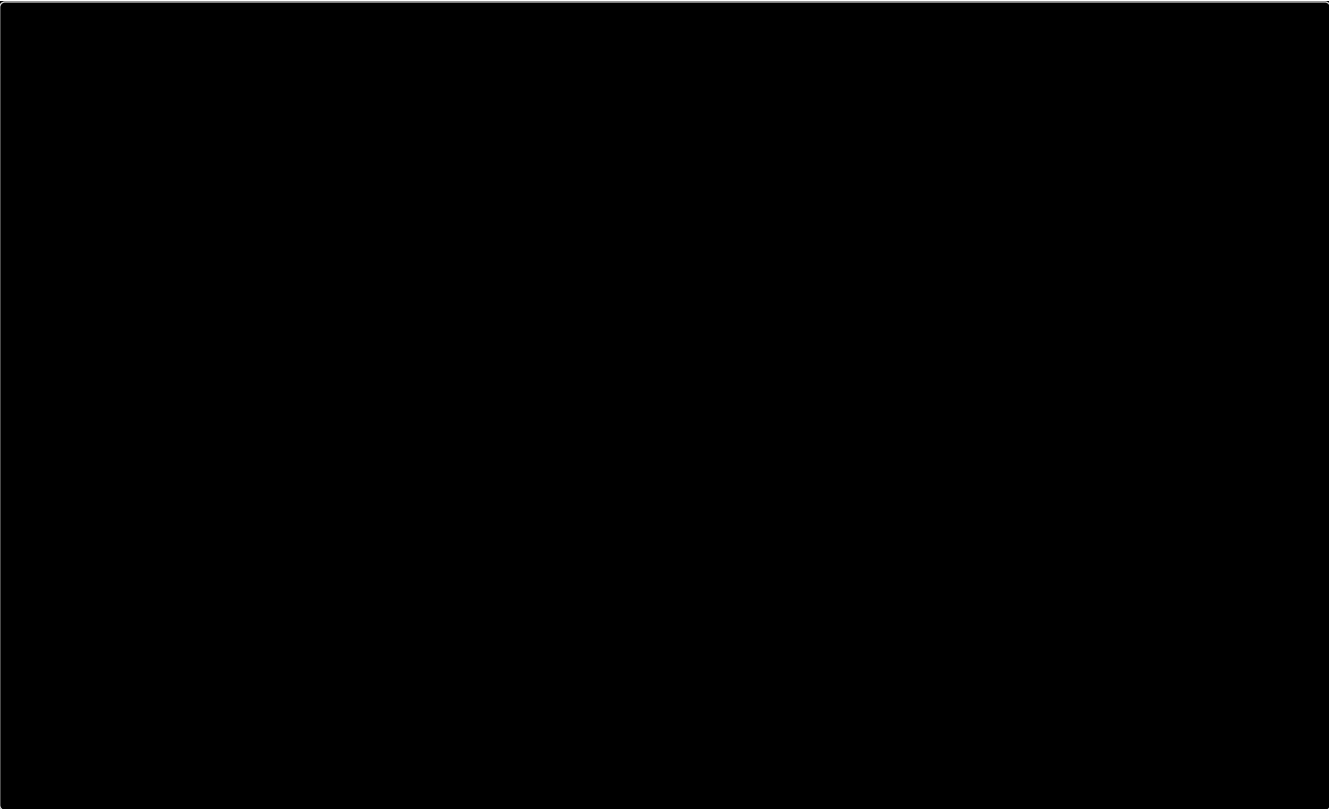


Figure 25. Rule Applying k Ü

Rule —¾ \ @T k Üm# ST–! «. 6r RuleW[ k ÜF åS&h ÞBP «. 6r ÇO@A «. 6< =.

Table 55. ÇO@A «.

VW	I J	X)
Node Name	a Ø3 Node group &NP Node Ò	
Server Name	a Ø3 Node&NP Server Ò	

!

í %\* Rulem – » ¢• < ÇO^ „ • @T ³ Nm Ôs server.xml { r context.xml m ÇO– ' , @T3 ¢• m# C\$g „ • NP W[ ( ) m ÇO3 Rule W[ < NC3=.

8.3.3. Service Control Log (Rule 2 ' 3 ´ Š> )

Rule< @T3 à@6m ¢ \* ÜL ĲFO @ØI J ~P3=. ÜL ĲF »AP ĲP. " NV Ruleå æ, @T ³ N, RuleÒ, J ç ² ^m ¢ \* – ĲM• " CD\* =.

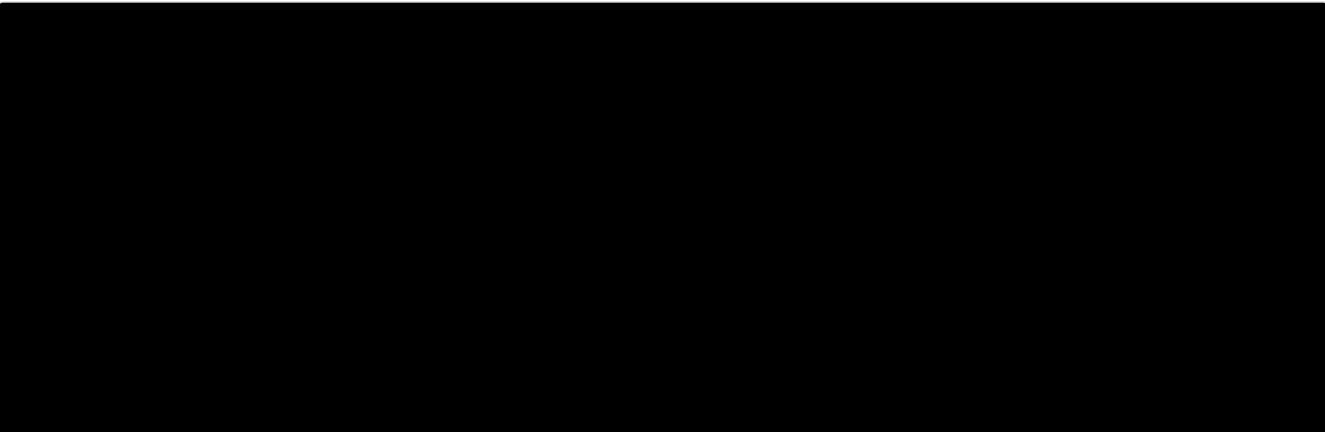


Figure 26. Service Control Log k Ü

ÜL @Øm# ST–! «. 6r ÞΒ´ . =.

Table 56. J ¿ [ > P à@

VW	I J	X)
Controlled Date	RuleW[ < @T 3 ) + P ÜL² ^	
Remote Address	ÜL 3 " ëp Æ/	
Request URL	ÜL 3 ) + P URL	
HTTP Method	ÜL 3 ) + P HTTP Method	
Rule Ò	) + " ÜL&! ' @T 3 Rule <Y	

Rule <PP „ • ManagerP /conf/manager.conf W[ ( ) ã access filter log , H Listener STzYB trueJ W[ VÝ \* =. LogP „ • ] #ÇP logs • } ã access\_filter.log."Çè".txt ( ) m MØ–h ÆM@I J Manager O ] server P log B , H&z Database m Tœ\* =. (<Ü , H3 Log ! access\_filter\_log."Çè".txt.gathered ( ) m backup3=) Databasem , H3 Log! ÜL@Ø k Üm# » A O• &=.

!

manager.conf ã W[ ( ) à@P W[ , ! ÞΒ´ . =.

```
#access filter log , H L%- STzY \ ` • ÆM(?) default!  
false, 60  
accessfilter.listener=false  
accessfilter.interval=60
```

8.4. Patch

WX3 LENAm Ç\* M• Öí \ Ç¿ e[ " N\* OXB CD\* =.

Patch! %¸ ( ) æþJ CD–h, . Ü@I J ` • &! Java„ J Ñ%J ` • \* =.

Patch M• r CLI \ Management UIB G&z >f < O• &h, OX² # \$%m f CO ; <&! „ • Restore M• " G&z " µ g e R=.

OX " #! =ÐF . =.

1. OX( ) òJ ,
2. Manager OX @T
3. Node OX @T
4. #Ç (Application Server, Session Server) OX @T
5. OX Commit

µ- " #! =ÐF . =.

1. #Ç OX µ-
2. Node OX µ-
3. Manager OX µ-
4. µ- Commit

CLIJ OX&! ñ| r AppendixB ä' \* =.

8.4.1. Overview

OX( ) P òJ , M• " CD&h, Manager¯ ] Nodež Node AgentP OX O†• p [ > B WX\* =.

Patch qr €t ©

Patch Info †ûm#! áî Tm òJ , 3 OX( ) ¼, é• N Çj P • Ñ[ > B §² \* =.

Table 57. Patch Info à @

VW	I J	X)
Patch File Ver.	OX( ) P Çj [ >	
Release Date	OX( ) P p1 ) U	
Patch Note	vw(µ¶) [ \ " í ® • Ñ* OX^ Ú ãT" WX* =.	OX^ Ú k ò§²

OX( ) " òJ , &! F[ r =ÐF . =.

1. €t © [ \ " €O\* =.
2. OX O• • pApB » A Q [ • <Ü OX( ) òJ , B N\* k ò" / ...=

!

OX O• • p Wà

1. Managerm a Ø3 NodeO +É M` • pz Ý\* =.
2. patchO commit• pz Ý \* =.
3. manager M` I J node¯ serverO +É . r Çj <8Ý \* =.
4. managerm a Ø– p qr #ÇOI ÷&p q! =.
  - a. unregister3 #ÇI ÷² managerm a Ø
  - b. ^ , RÍ &N servers• } m #ÇOI ÷² Vİ • } NC

3. òJ , g OX( ) " í %&Ü U` I J òJ , O >f 3=.

!

òJ, O• \* ( ) r zipF targz<h <\$P ( ) " òJ, g „ • m®Á² pO ~P3=.

Manager Patch

Manager Info † ûm#! ManagerP OX• þB §² &' , ManagerP OX \ μ- B >f g e R=.

k Üm §² –! ] à@m ¢\* WÖr þB⁻ . =.

Table 58. Manager Info à @

VW	I J	X)
Patch Status	ManagerP OX @T • þ  ¥ • MNO : ManagerO é - OXB @T * (up to date) • þ  ¥ ? ¿ MNO : ManagerO é - OXB @T &p q r (patch available) • þ	
Current Ver.	ManagerP —÷ ¢ j	
Patch Ver.	Patch ¢ j	
History	Patch historyB WX&! ¢ ⁻	Handwork • ò< ( ) ² , vw(μ¶) [ \ r å r £ I J §² 3=.

Manager Infok ÜP History à@m §² 3 vw(μ¶) [ \ " €O&Ü k òI " GV OX >f <P" » Ag e R=.

k Üm §² –! ] à@m ¢\* WÖr þB⁻ . =.

Table 59. History à @

VW	I J	X)
Action	OX/μ" <P" §²	
Patch Ver.	OX/μ" " ef * OX( ) P ¢ j	
Pervious Ver.	OX/μ" " @T &M < i P # ¢ ¢ i	
Timestamp	OX/μ" " @T * ² ^	
Log/Handwork	vw(μ¶) [ \ í %² >f ¬F J ¿ B CD* =.  RE€(¬¹ °) [ \ í %² Handwork(ÇO@I J ( ) * e• ò) ãT" CD* =. Handwork • ò ( ) ² Vĩ ¢ ⁻ r å r £ I J §² 3=.	

Patch

Manager Info &³ m R! Patch [ \ " €O&Ü é- OXB @T \* =.

Handworkm M©3 ãT OX>f Q ( ) \* e• ò< J , M©3 ãT" >f &z O† &z Ý \* =.

Handwork • ò Q k òI &³ P HÈ â %B VC&Ü Manager Patch Infok ÜP Handwork Ç ¯ < O£I J Æ„ 3=.

Manager OXB @T&Ü Node¯ ServerP OX @T Q Commit [ \ " Ì vM j Ép NodeP WX/aØ, ServerP WX/aØ/µC aP M• " ef g e ÿ=.

!

OX Q O, ² ös • T 1² B NC&z Ý OXÇj P ManagerB STg e R=.

Restore

Manager Info &³ m R! Restore [ \ " €O&Ü OX <j Çj I J µ- 3=.

µ- ! Managerm a Ø3 +, ^, P OX • pO Patch Available A „ • m ef \* =.

Commit

Manager, Node, ServerP +, OXB @T Q CommitÇ ¯ " í ® » [ \* =. » [ <Qm! <j Çj I J –² 2 e ÿ=.

Node Patch

Node Patch Status † ûr áî Tm aØ3 nodem ¢V#, é- OXO @T3 #ÇP Õe¯ OXO @T–p qr #ÇP ÕeBª HV# > z ¨=.

k Üm §² –! ] à@m ¢\* WÒr ÞB¯ . =

Table 60. Node Patch Status à @

VW	I J	X)
Status	nodeP OX @T • p  ¥ • MNO : +, #ÇO é- OXB @T* (up to date) • p  ¥ ? ¸ MNO : Node AgentO é- OXB @T&p qr (patch available) • p  ¥ ¯ ? MNO : Node Agent! é- OXB @T&ØI °, Node m WX3 Serverm! é- OXO @T–p qr • p  ¥ » ¼½ MNO : Node agentO lena-manager¯ šf< –p q! • p.	
Node name	nodeÒ	
Address	nodeP IP	
Node Version	NodeP —÷ Çj	
History	Patch historyB WX&! Ç ¯	Handwork • ò< ( )², vw(µ¶) [ \ r â r £I J §² 3=.

VW	I J	X)
WAS	Web Application ServerP OX• p [ >  ¥ Up To Date : é - OXO @T 3 #ç P Õe ¥ Patch Available : é - OXO @T–p q r #ç P Õe	

Node Patch [ \ " €O&Ü CD–! k òI m# Node í % Q Vİ Nodem ¢\* OX | ! µ- B  
Í f g e R=.

!

Window OS f „ m WX– 8 R! Node! ManagerO Þb CLIB GV OXB ef \* =.

8.4.2. Application Server

Nodem 1 2 3 Application Serverm ¢V#, áî Tm òJ, 3 é- OX() J OXB Í f &h,  
f C; <² OX @T > J | P • pJ µ" g e R! M• " CD\* =.

WY

OXB @Tg #ç B ¿ MŽ Wà (node³ N)I J – £ \* =.

Table 61. Application Server Patch Status à @

VW	I J	X)
Patch Status	Application ServerP OX @T • p  ¥ • MNO : é - OXO @T 3(up to date) • p ¥ ? ¿ MNO : é - OXB @Tg e R! (patch available) • p	
Node	Application ServerO WX– 8 R! NodeÒ	
Name	Application Server < Y	
Type	Application #ç Ž E	
IP	Application ServerO WX3 NodeP IP	
HTTP Port	Application ServerP HTTP Connector port	
AJP Port	Application ServerP AJP Connector port	
Start/Stop	Application ServerP M` \ ¼p > f	
Current Ver.	Application ServerP —÷ WX3 ç i [ >	

VW	I J	X)
PatchVer.	$OXB @Tg \text{ } \zeta_i [ > . \acute{e} - OXO @T 3 \bullet p) \\ , \bullet \text{ } \text{N/AU} \text{ } \S^2 3 = .$	$\acute{a}\hat{t} \text{ } Tm \text{ } upload3 \acute{e} - \\ OX\zeta_i$
History	Serverm @T* patch/restoreP < P[ > WX	



Node Agent process kill aP <åJ ` • < [ • @<p q" „ • ! , Vĭ nodeP Server [ > ! WX–p q! =.

## Patch

1.  $OX@T \text{ } i \text{ } \# \zeta P \text{ } \frac{1}{4}p \bullet pB \gg A\&'$  (Start [ \ z. k3 • p),  $\frac{1}{4}p \bullet pO \text{ } \text{P}3 \text{ } , \bullet$  Stop [ \ " €O&z #ζB  $\frac{1}{4}p^2 \tilde{a} =$ .
2.  $OXB @Tg \# \zeta P \text{ } H\grave{E}\hat{a}\%B \text{ } H\grave{E}^* = .(\mu e \text{ } H\grave{E} \text{ } O \bullet )$
3. Patch [ \ " €O&z  $OXB \acute{I} f^* = . < \grave{u} J \text{ } \text{ } k \grave{o} < 4d - h \text{ } OX^a J \text{ } Qe \bullet \grave{o} " \acute{I} f \text{ } V\acute{Y} g \text{ } S\grave{a} < R" \text{ } , \bullet$  Handwork i j m  $RE \in (-^1 \circ) [ \text{ } \backslash < \grave{a} r \text{ } \text{f} \text{ } I J \text{ } \S M3 =$ .
4.  $J \text{ } \text{ } k \grave{o} " | I \text{ } \grave{U} \# \zeta P \text{ } patch \text{ } status \bullet pO \bullet$  MNO I J  $\mathcal{A}_{\text{ } , - ' ,$  current ver., patch ver.m! ] ] @T\* —÷OXζi F N/AO  $\S^2 3 =$ .
5. Validation



- a.  $\# \zeta OM^ \bullet p) \grave{u} ! \text{ } OX @T \text{ } O$
- b.  $< 5 \acute{e} - \text{ } OXO @T 3 \# \zeta m =^2 \text{ } OXB @T \text{ } O$



#ζm OX@T  $\text{ }^2 \text{ } V\grave{I} \text{ } Nodem \text{ } OXB \text{ } \grave{u} \text{ } \text{ } @Tg \text{ } , \bullet , \tilde{a} Y @ I J \text{ } V\grave{I} \text{ } NodeP \text{ } OXB \text{ } \acute{U} T \acute{I} f^* \text{ } \mathcal{E} m \# \zeta OXB \acute{I} f \& d 3 =$ .

## Restore

1.  $\mu - @T \text{ } i \text{ } \# \zeta P \text{ } \frac{1}{4}p \bullet pB \gg A\&'$  (Start [ \ z. k3 • p),  $\frac{1}{4}p \bullet pO \text{ } \text{P}3 \text{ } , \bullet$  Stop [ \ " €O&z #ζB  $\frac{1}{4}p^2 \tilde{a} =$ .
  2.  $\mu " " @Tg \# \zeta P \text{ } H\grave{E}\hat{a}\%B \text{ } H\grave{E}^* = .(\mu e \text{ } H\grave{E} \text{ } O \bullet )$
  3. Restore [ \ " €O&z  $\mu - B \acute{I} f^* = . < \grave{u} J \text{ } \text{ } k \grave{o} < 4d 3 =$ .
  4.  $J \text{ } \text{ } k \grave{o} " | I \text{ } \grave{U} \# \zeta P \text{ } patch \text{ } status \bullet pO \text{ } ? ,$  MNO I J  $\mathcal{A}_{\text{ } , - ' ,$  current ver., patch ver.m! ] ] <i ζi F OX() ζi <  $\S^2 3 =$ .
  5. Validation
- a.  $\# \zeta OM^ \bullet p) \grave{u} \mu " " @T \text{ } O$
  - b.  $\mu " " ^* \text{ } \mathcal{E} m , =^2 \mu " r \text{ } O(\acute{a}\hat{t} \text{ } TB G^* \mu " r \text{ } 1^3 I i \text{ } p " ^* =)$



#ζm  $\mu " \acute{I} f \text{ } Q \text{ } Nodem \text{ } OXO @T 3 \# \zeta O \& ^\circ t \text{ } \grave{Y} " \text{ } , \bullet , \tilde{a} Y @ I J \text{ } V\grave{I} \text{ } NodeP \mu " t \text{ } 2 \acute{O} \acute{I} f^* =$ .

## N¾Š>

$vw(\mu \P) [ \text{ } \backslash " \text{ } \in O\&z \text{ } OX/\mu " \text{ } m \text{ } \text{ } \text{ } ^* < P " \text{ } O\ae \acute{e} \text{ } \acute{A} P < PYZ \text{ } 5 \acute{O} B \text{ } WX^* =$ .

Table 62. History à @

VW	I J	X)
Action	OX/μ" <P" §²	
Patch Ver.	OX/μ" " ef * OX() P ç i	
Previous Ver.	OX/μ" " @T&M < i P #çç i	
Timestamp	OX/μ" " @T * ² ^	
Log/Handwork	<div>vw(μ¶) [ \ í %² &gt;f ¬F J ¿ B CD* =.</div> <div>RE€(¬¹ °) [ \ í %² Handwork(ÇO@I J ( ) * e • ò) ãT" CD* =. Handwork • ò ( ) ² Vĩ ç¯ r âr £I J §² 3=.</div>	

## 8.5. Preferences

### 8.5.1. Action Trace

ManagerB GV ] STUO ef &! ÇO/e[ /NC • òP ef <Pr J ¿ J Ò! =. Action  
Tracem#! <®\* ef <P" WX/Ç@&! M• " CD\* =.

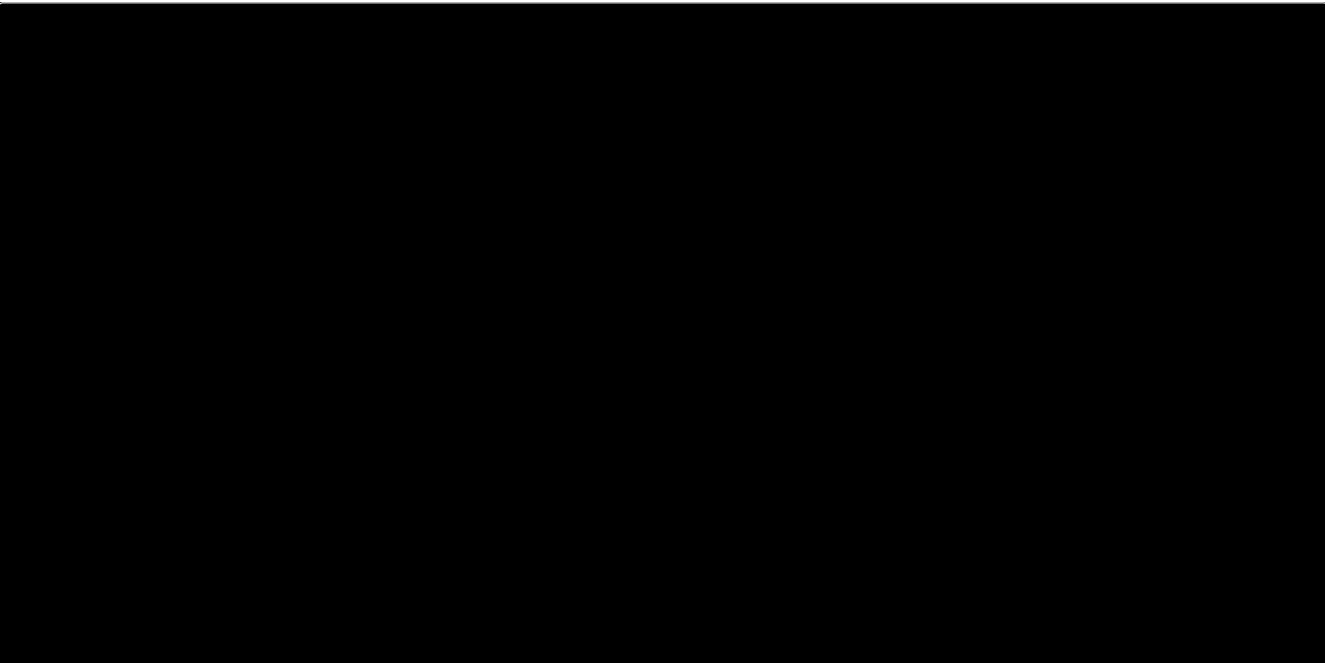


Figure 27. Action Trace k Ü

N¾ Š >  
WX Wà" EPQ €O&Ü <P" WXg e R=, @Ø ¼ &° B í %&Ü • Ñ[ > t » Ag e R=.  
WX k Üm §M– ! à@r ÞB¯ . =.

Table 63. <P • Ñ [ > à@



VW	I J	X)
Trace Date	Action" ef * 2 ^	
Status	Action ef → F	. D : Success, > O : Fail
Client IP	Action" ef * STUP IP Ë /	
User ID	Action" ef * STU ID	
Action	ef * z ` (Action) Ò	
Method	Actionm ST 3 Method < Y	
Request	LENA Manager Http Request URL	
Input	Http Request Input ( ≤ 5Z	

N à@ ¼ "Input" r Request ( ≤ 5Z B ¿ ¢J Tœ&M ùf m, Server ID, Node ID O ' < Z K L T Key] () { 8Š, 56k Üm# "serverID=31"J §² 3 Y&)I J > z Í =. Vİ Server/NodeP • Ñ[ > B WX&M NV#! "Action Trace Detail" [ > &³ m R! "Search ID" M• " z T \* =. < M• P E ~ P à@r Þß˘ . =.

Table 64. Search ID M• P E ~ P à@

VW	I J	X)
ID	¥ 56 Combo : serverId / nodeId ¼ %) ¥ • 6 : Input m R! ID ] " E P	E P à@
Data	– £ 3 Server/Node [ >	~ P à@

## 8.5.2. Documentation

LENA / ÖUJ ˘ áÂâ" =...J , , " e R=.

## 8.5.3. Manager Environment

Manager f„ W[ " N\* [ > B CD\* =.

### Manager Environment

Manager f„ W[ [ > ¼ env-manager.sh/batm Tœ&! [ > B CD\* =.

¥ Manager Allow IPs : Managerm ÃÄ O• \* IPà@" W[ \* =.

¥ Java Home Path : Managerm# ST &! java home „ J B W[ \* =.

### Manager Configuration

Manager f„ W[ [ > ¼ manager.confm Tœ&! [ > B CD\* =.

Mú@I J CD&! 2Op à@" CD\* =.

¥ use JMX for Server Status : JMXB GV #ç • þ [ > B WXgp z Y (default : false)

¥ use Server Delete Protection : Managerm# #Ç NC M• ST 7p z Y (default : false)

k Ü • 6P I ] [ \ " €O&Ü • Ñ [ > B » A \ Æ„ g e R=.

Metadata Refresh

Topology ÁÂm# ² %½ ž - . [ > B topology oÚJ ĸ LM NV ST–! ÁŽ' <Z P [ H. –§  
 \ μ" M• " ef\* =.

Reset manager address of all registered nodes

Managerm a Ø3 ^ , 6md Æ„ 3 Manager AddressB ) Œ@I J Æ„ ² 8Ě! M• " CD\* =.

# Chapter 9. Appendix

## 9.1. LENA • - @? ' V

LENAB WX&' ST&M N\* é/ ) - Sarà =DF . =.

?¿	JVM	CPU	Memory	Disk	Support OS	X)
Mú WX OSp	JDK 1.8 <•	2 Core <•	4 GB <•	rootB C\$* TÎ 10GB <•	Linux (centos7 <•)	] - . ) / WX ( ) CD

## 9.2. Manager cÆ ÀÁÿÂ

ManagerP M• " STg e R! ös•Tª: ! =DF . =.

IEP , • ) YM• < [ • @I J ` • &p qM ùfm =´ ös•TB ST&MB Åœ\* =.

· Ã	[ £	X)
Chrome	81	

## 9.3. Manager DBqr Ä€

ManagerP āY' <Z KLB N\* HSQL DBP ( ) r ĖM@I J (1) ) ~ò( ) " <. &' R=.  
<. NX! \${LENA\_HOME}/etc./backup/lena-manager/script <=.

Mú@I J 30) <¡ ~ò[ > ! NC&tØ -8 R! ' > KM^" Æ„ &' ¢r „ • ,  
\${LENA\_HOME}/conf • } &Nm manager.conf ( ) " • ' , dbbackup.size=> KM^ " EP Q  
ManagerB ÷ M` &Ü > KM^" Æ„ g e R=.

## 9.4. Manager 7 ÅÆN¾ ` =

ManagerO āY@I J ÒM! <Pr ĖM@I J NC&tØ %r 9õ< -8 R=.

NC&! [ > !  
Action Trace <PF Server History <P<=.

Mú@I J Action Trace<Pr 30) Épi > K&' , Server History <Pr 90) Ép > K&' R=.

< > KM^" Æ„ &' ¢r „ • \${LENA\_HOME}/conf • } &Nm manager.conf ( ) " • ' ,  
actiontrace.size=> KM^, serverhistory.size=> KM^" EP Q ManagerB ÷ M` &Ü > KM^"  
Æ„ g e R=.

## 9.5. Manager 7 admin , -Ç© È; :

ManagerP adminSTU O%>, B &>&n° \$i 8š 9: ÅeO ?F&ø" „ • m! consoleB  
G&Z O%>, B ?Mk VÝ \* =.

1. ManagerO WX3 œ\$m console(telnet or ssh)J Ã« \* =.
2. \$LENA\_HOME/bin/reset\_manager\_pw.sh ( ) " >f \* =.

3. O%>, B ?Mk g userA admin" EP\* =.
4. ?Mk g O%>, B EP\* =. 3, O%>, ! 8UL<•, a(: /üU/Kef UP WHI J EP\* =.  
O%>, ! >· " NV consolem §² – p q! =.

```
[bi n]$ ./reset-manager-pw.sh

É*****
* LENA Server Install ! *
É*****

+-----+
--
| 1. USER_ID is the user id to reset
| ex : admin
| 2. NEW_PASSWORD is the password to change
| - password rule #1 : more than 8 length
| - password rule #2 : inclusion of one or more alphabet characters
| - password rule #3 : inclusion of one or more numerical digits
| - password rule #4 : inclusion of one or more special characters
+-----+
--

Input USER_ID for installation. (q: quit)
admini strator

Input NEW_PASSWORD for installation. (q: quit)

The password has been changed successfully.

Execution is completed.!!
```

## 9.6. LENA I É —O OSqÁÊ † (CentOS; K)

LENA WX ² OS( s 5Z! max user processes ] " 8192 <• I J W[ &! ý" Åœ\* =.

parameter	—Oa	; ga
max user processes	8192	1024
open files	8192	1024

CentOSM¨ I J max user processes W[ r =ÐF . < ùlimit Ðaŀ Òì 8B >f &z »A" g e R=.

```
$ ulimit -a +
core file size (blocks, -c) 0 +
data seg size (kbytes, -d) unlimited +
scheduling priority (nice, -e) 0 +
file size (blocks, -f) 8192 +
pending signals (i) 14891 +
max locked memory (kbytes, -l) 64 +
max memory size (kbytes, -m) unlimited +
open files (n) 1024 +
pipe size (512 bytes, -p) 8 +
POSIX message queues (bytes, -q) 819200 +
real-time priority (r) 0 +
stack size (kbytes, -s) 10240 +
cpu time (seconds, -t) unlimited +
*max user processes (-u) 1024* +
virtual memory (kbytes, -v) unlimited +
file locks (x) unlimited
```

CentOS 7 M` I J ` 8 ulimit Đu` ulimit ĐnŮ „ J Ń% e` 9; ( ) ŌeB W[ g e R=. N  
 Æ„ Sà" † - @I J O† &M NV#! ] ă TP profile (.profile, .bash\_profile)m ulimit >f Ōi "  
 ÇO&n° , - C W[ g e R= (CentOS M` ).

```
*$ cat $HOME/.bash_profile*
```

```
*.. (<<)*
```

```
*ulimit -u 8192*
```

```
*ulimit -n 8192*
```

! =` W[ Ńwl J! /etc/security/limits.conf (CentOS M`) ( ) " • 8# „ J Ń% é ¢e(nproc)-  
 9; ( ) é ¢e(nofile)B W[ \* =.

```
*$ cat /etc/security/limits.conf*
```

```
*.. (<<)*
```

```
** soft nproc 8192*
```

```
** hard nproc 8192*
```

```
** soft nofile 8192*
```

```
** hard nofile 8192*
```

## 9.7. LENA B; ² È t Ì f z! q r

VW	Qt	` = B;	Í Î v Ì f Ì	X)
Manager[ M~ – J «	LENA_HOME/repository/m onitoringDB/maintenance	6Ö=	10MB	#Ç 6Ç Mˆ P , • §OÎ Uˆ NC>
Manager+Î Z Ö, Í ³ L 1 Ú	LENA_HOME/repository/m onitoringDB/{yyyyMMdd}	7)	N/A	Uˆ NC
ManagerÍ ³ GI	LENA_HOME/repository/m onitoringDB/statistics	† -	1MB < &	>
ManagerDB~ ò ( )	LENA_HOME/repository/b ackup/database	30)	100MB < &	Uˆ NC
ManagerJ Ğ	LENA_HOME/logs/lena- manager	30)	100MB < &	Uˆ NC
AgentJ Ğ	LENA_HOME/logs/lena- agent	30)	N/A	Uˆ NC
InstallerJ Ğ	LENA_HOME/logs/lena- installer	† -	1MB < &	>
Patch@T ( )	LENA_HOME/etc/patch	† -	N/A	OX² mi < . / OXˆ J Q NCO•
Patch~ ò ( )	LENA_HOME/etc/backup/l ena-patcher	† -	N/A	OX² mi < . / OXˆ J Q NCO•
PatchJ Ğ	LENA_HOME/logs/lena- patcher	† -	N/A	OX² mi < . / OXˆ J Q NCO•
#Ç A%×%J Ğ	#Ç A%×%WX„ J LENA_HOME/servers/serv er_id/logs	† -	Y&m Ôs ¿ ³	„ J Æ„ O•
#Ç A%×% Ð%uL	#Ç A%×%WX„ J LENA_HOME/servers/serv er_id/history	† -	N/A	ManagerB GV #Ç W[ Æ„ ² m W[ ( ) Æ„ &i < .

## 9.8. About LENA

LENA CEF K{ &z ? 7\* Sàr ÞBP , J B GV f PVĚ² M> @î =.

¥ Email: [lens-support@lgcns.com](mailto:lens-support@lgcns.com)

¥ Website: <https://soltech.lgcns.com/>

¥ Location: # A² - # - BB¼C8J 71 LGS<¿ %( È E13, E14