



Avaya Solution & Interoperability Test Lab

Application Notes for Dialogic PowerVille LB with Avaya Aura[®] Session Manager – Issue 1.0

Abstract

These Application Notes describe configuration steps required for Dialogic PowerVille LB to interoperate with Avaya Aura[®] Session Manager.

Dialogic PowerVille LB is a software based load-balancer for SIP traffic. During the compliance test Dialogic PowerVille LB load balanced SIP traffic between two Avaya Aura[®] Session Managers.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe configuration steps required for Dialogic PowerVille LB (PowerVille LB) to interoperate with Avaya Aura[®] Session Manager (Session Manager).

Dialogic PowerVille LB is a software based load-balancer for SIP traffic. During the compliance test PowerVille LB load-balanced inbound SIP traffic between two Session Managers. PowerVille LB has the ability to work in either Active/Active or Active/Standby mode. In Active/Active mode, SIP traffic is divided, approximately 50%, between two Session Managers. In Active/Standby mode, SIP traffic is sent to primary Session Manager. In an event where primary Session Manager is unavailable, SIP traffic is sent to secondary Session Manager.

2. General Test Approach and Test Results

The compliance test focused on verifying load-balancing features offered by PowerVille LB. During the compliance testing, ingress SIP traffic from SIP trunk (SIP Entity) was a primary focus.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The compliance test included the following feature tests. During the compliance test, a pair of PowerVille LB was tested. All calls were generated using a SIP call generation tool:

- SIP OPTIONS to and from PowerVille LB
- SIP traffic load-balancing for SIP Trunk (SIP Entity) in Active/Active mode
- SIP traffic for SIP Trunk (SIP Entity) in Active/Standby mode
- SIP traffic failover in Active/Active and Active/Standby modes
- SIP traffic failover between PowerVille LB

Serviceability tests for Session Manager were performed by network disconnects and Deny Service. For PowerVille LB, network disconnects and server reboots were performed.

2.2. Test Results

All planned test cases were passed with following observations:

- When PowerVille LB is in Active/Active mode, and one of the Session Managers becomes unavailable, calls that are mid-stream, may fail. Calls in-progress will continue to work.
- When PowerVille LB is in Active/Standby mode, and the primary Session Manager becomes unavailable, new calls may fail until PowerVille LB detects the unavailability.

- OPTIONS messages from a SIP trunk (SIP Entity) to Session Manager are responded by PowerVille LB.

Note that SIP EndpointRegistration via PowerVille LB is not supported by Avaya.

2.3. Support

Technical support for Dialogic PowerVille LB can be obtained via following means:

- **Web:** <http://www.dialogic.com/support/contact/default.aspx>
- **Email:** america.support@dialogic.com
- **Phone:** +1-973-993-1443

3. Reference Configuration

Figure 1 illustrates the compliance test configuration consisting of:

- Avaya Aura® Communication Manager
- Avaya Aura® Session Manager
- Avaya Aura® System Manager
- Avaya Aura® Media Server
- Avaya G450 Media Gateway
- Avaya 96xx IP Deskphone
- Avaya Digital and Analog Phones
- Dialogic PowerVille LB

All Avaya and Dialogic products were installed on a virtualization platform, with the exception of Avaya G450 Gateway.

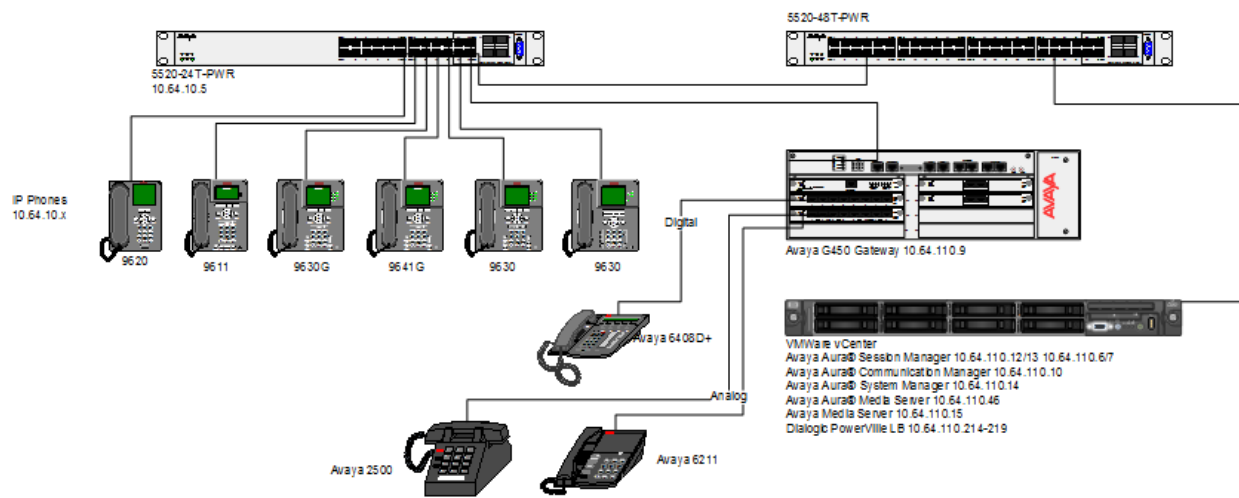


Figure 1 – Test Configuration

Figure 2 diagram below displays logical view of the inbound calls routed to Session Manager via PowerVille LB.

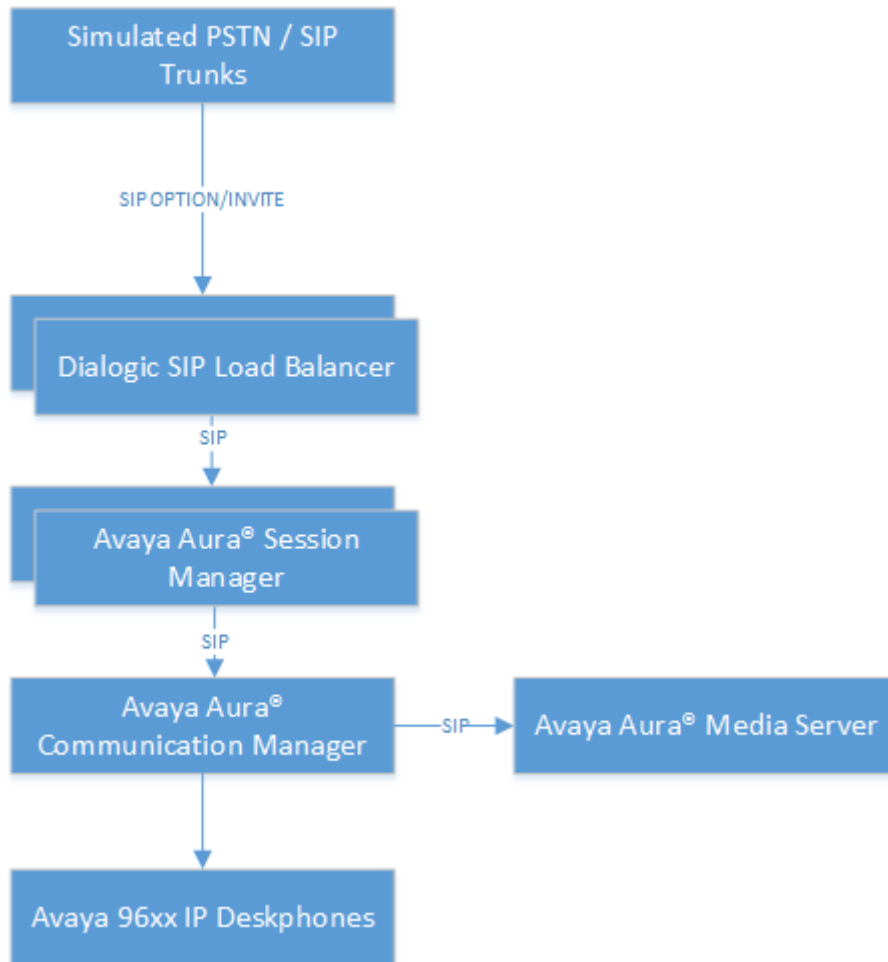


Figure 2 – Call Flow

4. Equipment and Software Validated

The following equipment and version were used in the reference configuration described above:

Equipment	Version
Avaya Aura [®] Communication Manager	7.0.1.1.1-FP1SP1
Avaya Aura [®] Session Manager	7.0.1.1.701114
Avaya Aura [®] System Manager	7.0.1.1
Avaya Aura [®] Media Server	7.7.0.359
Avaya G450 Gateway	37.19.0
Avaya 96xx IP Deskphones	Latest - Various
Dialogic PowerVille LB	lb-1.4.6

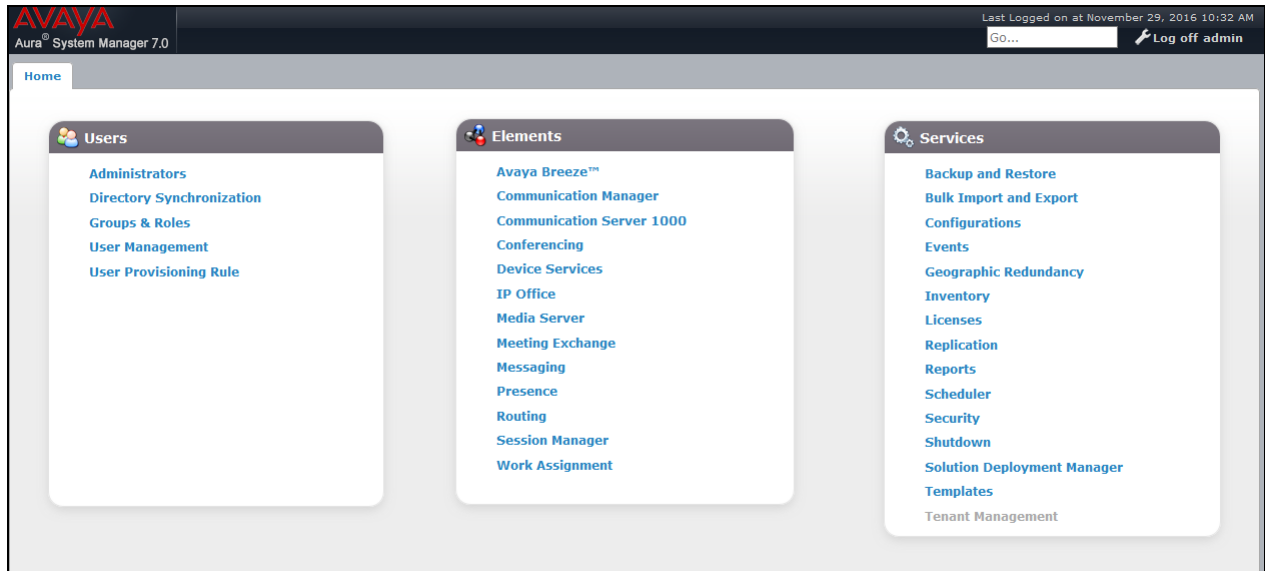
5. Configure Avaya Aura[®] Session Manager

This section provides the steps for configuring Session Manager to interoperate with PowerVille LB. For more details, refer to [2] in **Section 9**.

Session Manager is configured using browser access to System Manager. Enter the URL of System Manager such as <https://<hostname>/network-login/SMGR> where <hostname> is the ip address or qualified domain name of the System Manager. Log in using appropriate credentials.

Note that the basic configuration for Session Managers and Communication Manager had been pre-configured and is not documented. Two Session Managers were installed and configured. Please refer to the documentation in **Additional References** for more information.

The home page is a navigation screen as shown below. Each of these links will open a new tab from which to navigate to the details of the managed environment.



5.1. Configure SIP Entity and Entity Links

Navigate to **Routing** → **SIP Entity**. Select **New** to add a SIP entity for PowerVille LB.

- Enter the **Name** and **FQDN or IP Address**
- Type in the IP Address of the PowerVille LB for **FQDN or IP Address**

Under **Entity Link**, add two Entity Links, select **Add**.

- Type in a name in **Name**
- For **SIP Entity 1** select Session Manager
- For **Protocol** select **TCP**
- For **SIP Entity 2** select the SIP Entity that is currently being configured.

Add another Entity Link following the steps above, however select the secondary Session Manager for **SIP Entity 1**.

SIP Entity Details

Commit Cancel

General

* **Name:** PoweVilleLB

* **FQDN or IP Address:** 10.64.110.219

Type: SIP Trunk

Notes:

Adaptation:

Location:

Time Zone: America/Fortaleza

* **SIP Timer B/F (in seconds):** 4

Credential name:

Securable:

Call Detail Recording: egress

Entity Links

Override Port & Transport with DNS SRV:

Add Remove
Filter: Enable

2 Items

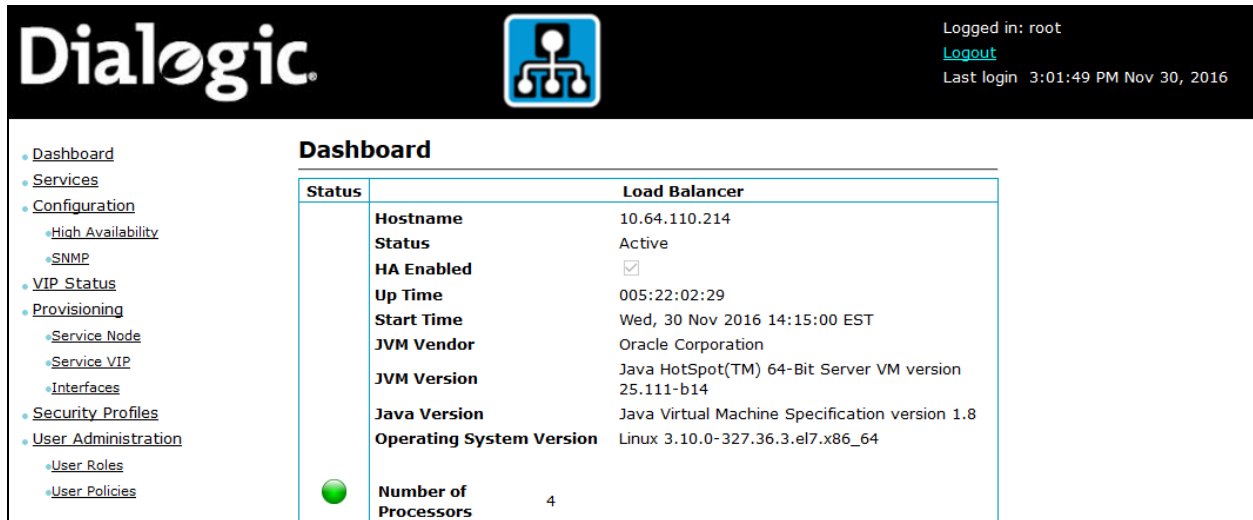
<input type="checkbox"/>	Name	SIP Entity 1	Protocol	Port	SIP Entity 2	Port	Connection Policy	Deny New Service
<input type="checkbox"/>	* asm-secondary_sipp-ua:	asm-secondary	TCP	* 5060	PoweVilleLB	* 5060	trusted	<input type="checkbox"/>
<input type="checkbox"/>	* asm_sipp_5060_UDP	asm	TCP	* 5060	PoweVilleLB	* 5060	trusted	<input type="checkbox"/>

Select : All, None


6. Configure Dialogic PowerVille LB

This section provides the steps for configuring the PowerVille LB. For more details on configuring PowerVille LB including how to install the PowerVille LB, please refer to the administration guide in **Additional References [8]**.

The PowerVille LB console is a web-based graphical user interface (WebGUI) used to manage the PowerVille LB. Launch the PowerVille LB admin UI login page in a web browser using the following URL: `http://{server_address}:8888/lb`. Log on using appropriate credentials.



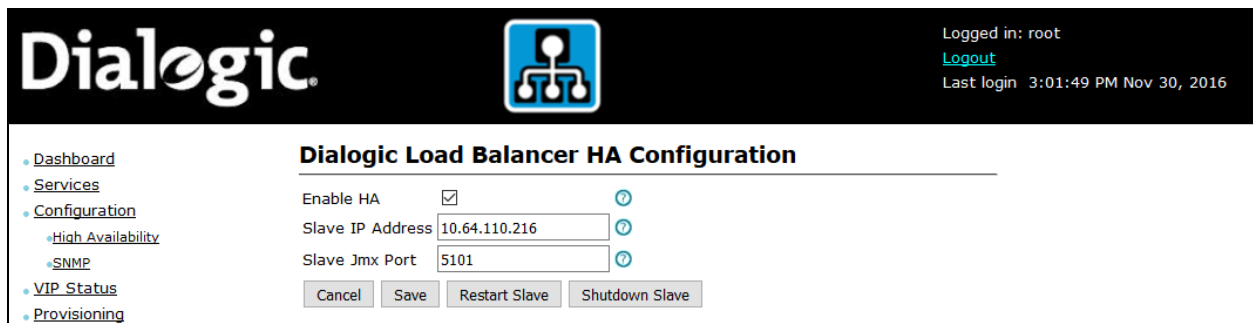
The screenshot shows the Dialogic web interface. The top header includes the Dialogic logo, a network icon, and user information: "Logged in: root", "Logout", and "Last login 3:01:49 PM Nov 30, 2016". The main content area is titled "Dashboard" and features a table with system details:

Status	Load Balancer
	Hostname 10.64.110.214
	Status Active
	HA Enabled <input checked="" type="checkbox"/>
	Up Time 005:22:02:29
	Start Time Wed, 30 Nov 2016 14:15:00 EST
	JVM Vendor Oracle Corporation
	JVM Version Java HotSpot(TM) 64-Bit Server VM version 25.111-b14
	Java Version Java Virtual Machine Specification version 1.8
	Operating System Version Linux 3.10.0-327.36.3.el7.x86_64
	Number of Processors 4




6.1. Enabling High Availability

Navigate to **Configuration → High Availability**.

- Select the **Enable HA** check box.
- Enter the IP Address of the secondary PowerVille LB node in the **Slave IP Address** field.
- Click the **Save** button at the bottom of the page followed by **Restart Slave**.




The screenshot shows the "Dialogic Load Balancer HA Configuration" page. It includes the Dialogic logo, network icon, and user information: "Logged in: root", "Logout", and "Last login 3:01:49 PM Nov 30, 2016". The configuration fields are:

- Enable HA: 
- Slave IP Address: 
- Slave Jmx Port: 



At the bottom, there are four buttons: "Cancel", "Save", "Restart Slave", and "Shutdown Slave".

Navigate to the **Configuration** page and click the **Restart** button.

Dialogic  Logged in: root
[Logout](#)
Last login 3:01:49 PM Nov 30, 2016

• [Dashboard](#)
• [Services](#)
• [Configuration](#)
 • [High Availability](#)
 • [SNMP](#)
• [VIP Status](#)
• [Provisioning](#)


Dialogic Load Balancer Configuration

IP Address 
JMX Bind Address 
Enable Detailed Logging

6.2. Configuring Routing Interfaces


Navigate to **Provisioning** → **Interfaces** (not shown). Click the **Add** button.

- Select the chosen signaling interface from the **Interface** drop down list.
- Click the **Add** button.

Dialogic  Logged in: root
[Logout](#)
Last login 3:01:49 PM Nov 30, 2016

• [Dashboard](#)
• [Services](#)
• [Configuration](#)
 • [High Availability](#)

Add Interface


Interface 

6.3. Configuring Virtual IP Address

Navigate to **Provisioning** → **Service VIP**. Click the **Add** button.

- Enter the Ingress VIP (A side VIP) IP Address (10.64.110.218) in the **address** field (not shown).
- Select the previously added Interface from the **Interface Name** drop down list (not shown).
- Repeat the above steps for the Egress VIP (B side VIP) IP Address (10.64.110.219).

Screen capture below displays the configured VIPs during compliance testing.

Dialogic  Logged in: root
[Logout](#)
Last login 3:01:49 PM Nov 30, 2016

• [Dashboard](#)
• [Services](#)
• [Configuration](#)
 • [High Availability](#)
 • [SNMP](#)
• [VIP Status](#)
• [Provisioning](#)
 • [Service Node](#)
 • [Service VIP](#)

Service VIP Provisioning

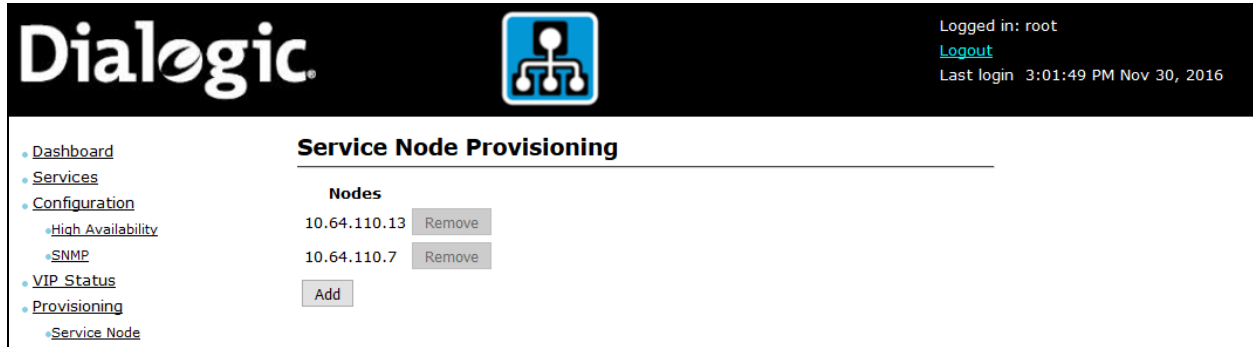
VIP	Interface	
10.64.110.218	eno16777984	<input type="button" value="Remove"/>
10.64.110.219	eno16777984	<input type="button" value="Remove"/>

6.4. Configuring PowerVille LB for Session Manager

Navigate to **Provisioning** → **Service Node**. Click the **Add** button.

- Enter the SIP IP Address of first Session Manager in the **Address** field (not shown).
- Click the **Save** button (not shown).
- Repeat above steps for the secondary Session Manager.

Screen capture below displays the configured Service Nodes during compliance testing.




The screenshot shows the Dialogic web interface for Service Node Provisioning. The header includes the Dialogic logo, a network icon, and user information: "Logged in: root", "Logout", and "Last login 3:01:49 PM Nov 30, 2016". The left sidebar contains a navigation menu with items: Dashboard, Services, Configuration (with sub-items High Availability and SNMP), VIP Status, Provisioning, and Service Node. The main content area is titled "Service Node Provisioning" and displays a table of nodes:

Nodes	
10.64.110.13	<input type="button" value="Remove"/>
10.64.110.7	<input type="button" value="Remove"/>
<input type="button" value="Add"/>	

6.5. Adding a Loadbalancer Service for an Active/Active Set Up (Round Robin)

Navigate to **Services**. Click the **Add Service** button.

- Enter an identifier for the service in the **Name** field.
- Select the service type **SIP** in the **Type** field.
- Click the **Next** button (not shown).
- Select the Ingress (A side inbound) VIP and Egress (B side outbound) VIP from the respective **Inbound VIP Bind Address** and **Outbound VIP Bind Address** drop down fields.
- Select **Round Robin** from the **Algorithm** drop down field.
- Select **Rewrite R-URI** in the **Routing Option** drop down field.
- Click the **Next** button (not shown).
- Configure the nodes for the service by following the steps outlined within **Nodes** subsection under the **Service Configuration** section of [8] in **Additional References**. Ensure the primary Session Manager node is added first.
- Click the **Save** button to add the service.

Dialogic  Logged in: root
[Logout](#)
Last login 12:17:11 PM Dec 6, 2016

LB Service Configuration

Service Name ⓘ

Type

General	
Inbound VIP Bind Address	<input type="text" value="10.64.110.218"/> ⓘ
Outbound VIP Bind Address	<input type="text" value="10.64.110.219"/> ⓘ
Algorithm	<input type="text" value="Round Robin"/> ⓘ
Max Java Heap Size (MB)	<input type="text" value="1024"/> ⓘ

Port Configuration		
Port type	Enabled	Port number
SIP (non-TLS)	<input checked="" type="checkbox"/>	<input type="text" value="5060"/> ⓘ
SIP (TLS)	<input type="checkbox"/>	<input type="text" value="5061"/> ⓘ
WS-SIP	<input type="checkbox"/>	<input type="text" value="8090"/> ⓘ
WSS-SIP	<input type="checkbox"/>	<input type="text" value="8091"/> ⓘ



SIP Configuration	
Routing Option	<input type="text" value="Rewrite R-URI"/> ⓘ
Enable SIP Dialog Aware	<input checked="" type="checkbox"/> ⓘ
Enable Recursion on 3xx Responses	<input type="checkbox"/> ⓘ

Logging	
Enable Detailed Logging	<input type="checkbox"/>
Enable Stack Logging	<input type="checkbox"/>
Enable SIP Message Logging	<input type="checkbox"/>

TLS Configuration	
Encrypt A-side	<input type="checkbox"/> ⓘ
Encrypt B-side	<input type="checkbox"/> ⓘ
Security Profile	<input type="text" value=""/> ⓘ

6.6. Adding a Loadbalancer Service for an Active/Standby Set Up (Priority)

Follow the steps outlined in **Section 6.5** but instead of selecting the **Round Robin** algorithm from the **Algorithm** drop down field select **Priority**.

Logged in: root
[Logout](#)
 Last login 12:17:11 PM Dec 6, 2016

- [Dashboard](#)
- [Services](#)
- [Configuration](#)
 - [High Availability](#)
 - [SNMP](#)
- [VIP Status](#)
- [Provisioning](#)
 - [Service Node](#)
 - [Service VIP](#)
 - [Interfaces](#)
- [Security Profiles](#)
- [User Administration](#)
 - [User Roles](#)
 - [User Policies](#)

LB Service Configuration

Service Name ⓘ

Type SIP

General	
Inbound VIP Bind Address	<input type="text" value="10.64.110.218"/> ⓘ
Outbound VIP Bind Address	<input type="text" value="10.64.110.219"/> ⓘ
Algorithm	<input type="text" value="Priority"/> ⓘ
Max Java Heap Size (MB)	<input type="text" value="1024"/> ⓘ

Port Configuration		
Port type	Enabled	Port number
SIP (non-TLS)	<input checked="" type="checkbox"/>	<input type="text" value="5060"/> ⓘ
SIP (TLS)	<input type="checkbox"/>	<input type="text" value="5061"/> ⓘ
WS-SIP	<input type="checkbox"/>	<input type="text" value="8090"/> ⓘ
WSS-SIP	<input type="checkbox"/>	<input type="text" value="8091"/> ⓘ

Logging	
Enable Detailed Logging	<input type="checkbox"/>
Enable Stack Logging	<input type="checkbox"/>
Enable SIP Message Logging	<input type="checkbox"/>

SIP Configuration	
Routing Option	<input type="text" value="Rewrite R-URI"/> ⓘ
Enable SIP Dialog Aware	<input checked="" type="checkbox"/> ⓘ
Enable Recursion on 3xx Responses	<input type="checkbox"/> ⓘ

TLS Configuration	
Encrypt A-side	<input type="checkbox"/> ⓘ
Encrypt B-side	<input type="checkbox"/> ⓘ
Security Profile	<input type="text" value=""/> ⓘ

7. Verification Steps

Via System Manager, navigate to **Session Manager → System Status → SIP Entity Monitoring**. Verify the Entity Links to PowerVille LB is in **UP Link State**.

SIP Entity, Entity Link Connection Status

This page displays detailed connection status for all entity links from all Session Manager instances to a single SIP entity.

All Entity Links to SIP Entity: PoweVilleLB

Summary View


Status Details for the selected Session Manager:

2 Items | Refresh Filter: Enable

Session Manager Name	SIP Entity Resolved IP	Port	Proto.	Deny	Conn. Status	Reason Code	Link Status
asm	10.64.110.219	5060	TCP	FALSE	UP	500 Caller not a configured node	UP
asm-secondary	10.64.110.219	5060	TCP	FALSE	UP	500 Caller not a configured node	UP


7.1. Loadbalancer Verification


Navigate to the PowerVille LB WebGUI homepage and ensure the dashboard displays a green light status for the Master and Slave PowerVille LB node.

Dialogic  Logged in: root
[Logout](#)
 Last login 12:17:11 PM Dec 6, 2016

Dashboard

- Dashboard
- Services
- Configuration
 - High Availability
 - SNMP
- VIP Status
- Provisioning
 - Service Node
 - Service VIP
 - Interfaces
- Security Profiles
- User Administration
 - User Roles
 - User Policies

Status	Load Balancer			
	Hostname	10.64.110.214		
	Status	Active		
	HA Enabled	<input checked="" type="checkbox"/>		
	Up Time	005:23:58:10		
	Start Time	Wed, 30 Nov 2016 14:15:00 EST		
	JVM Vendor	Oracle Corporation		
	JVM Version	Java HotSpot(TM) 64-Bit Server VM version 25.111-b14		
	Java Version	Java Virtual Machine Specification version 1.8		
	Operating System Version	Linux 3.10.0-327.36.3.el7.x86_64		
	Number of Processors	4	Number of Threads	47
	Architecture	amd64	Peak Number of Threads	50
	Heap Size		Non Heap Size	
	Initial	256.0 MB	Initial	2.44 MB
	Current	134.39 MB	Current	25.91 MB
Maximum	512.0 MB	Maximum	-0.0 MB	
Committed	256.0 MB	Committed	27.31 MB	

Status	Paired Load Balancer	
	Hostname	10.64.110.216
	Status	Active

Navigate to **Services** via the WebGUI. Ensure the given service for both the Master and Slave loadbalancer displays the green status.

Load Balancer Services

Add Service

	Aura SM 10.64.110.218:5060
	<i>SIP</i>
	10.64.110.13:5060
	10.64.110.7:5060
	Paired LB Status

Navigate to the **Vip Status** page, ensure a green status is displayed and a valid loadbalancer node IP address is displayed in the **Controlling Node IP Address** column of the VIP status table.

VIP Manager - Running

VIP	Controlling Node IP Address	Controlling Node Candidates
10.64.110.218	10.64.110.214	2
10.64.110.219	10.64.110.214	2

8. Conclusion

Dialogic PowerVille LB successfully completed compliance testing with the observations noted in **Section 2.2**.

9. Additional References

Product documentation for Avaya products may be found at <http://support.avaya.com>.

- [1] *Deploying Avaya Aura® System Manager, Release 7.0, August 2015*
- [2] *Administering Avaya Aura® System Manager, Release 7.0, August 2015*
- [3] *Deploying Avaya Aura® Session Manager on VMWare, Release 7.0, August 2015*
- [4] *Administering Avaya Aura® Session Manager, Release 7.0, August 2015*
- [5] *Deploying Avaya Aura® Communication Manager in Virtualized Environment, Release 7.0, August 2015*
- [6] *Deploying and Updating Avaya Aura® Media Server Appliance, Release 7.7, October 2015*
- [7] *Implementing Avaya Aura® Media Server, Release 7.7, January 2016*
- [8] *PowerVille LB Installation and Operations Guide, November 2016*

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