Application Notes for Extron DMP 128 Plus C V with Avaya Aura® Communication Manager and Avaya Aura® Session Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya Aura® Communication Manager and Avaya Aura® Session Manager. The Extron DMP 128 Plus C V is a digital matrix processor suitable for conferencing applications. Configuration is performed via the Extron DSP Configurator, which provides a GUI for easy visualization of all the signal paths within a single window and the ability to adjust all input levels, DSP processing parameters, mixing points, and output levels. VoIP configuration is performed via a dedicated webpage, simplifying the setup and management for IT personnel. Extron DMP 128 Plus C V registers to Avaya Aura® Session Manager as a SIP endpoint. These Application Notes also apply to the Extron DMP 128 Plus C V AT (although not explicitly tested), which only differs in that it provides DANTE support.

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 the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya Aura® Communication Manager and Avaya Aura® Session Manager. The Extron DMP 128 Plus C V is a digital matrix processor suitable for conferencing applications. Configuration is performed via the Extron DSP Configurator, which provides a GUI for easy visualization of all the signal paths within a single window and the ability to adjust all input levels, DSP processing parameters, mixing points, and output levels. Extron DMP 128 Plus C V registers to Avaya Aura® Session Manager as a SIP endpoint. These Application Notes also apply to the Extron DMP 128 Plus C V AT (although not explicitly tested), which only differs in that it provides DANTE support.

2. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. The feature testing focused on establishing calls between DMP 128 Plus, Avaya SIP/H.323 desk phones and the PSTN, and exercising basic telephony features, such as hold, mute, and conference. Additional telephony features, such as call forward, follow me, and call pickup were also verified using Communication Manager Features Access Codes (FACs).

The serviceability testing focused on verifying that DMP 128 Plus returned to service after reconnecting the Ethernet cable or rebooting DMP 128 Plus.

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.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in this DevConnect Application Note included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and Extron DMP 128 Plus C V did not include use of any specific encryption features as requested by Extron.
2.1. Interoperability Compliance Testing
Interoperability compliance testing covered the following features and functionality:

- SIP registration of DMP 128 Plus with Session Manager.
- Calls between DMP 128 Plus and Avaya SIP/H.323 deskphones with Direct IP Media (Shuffling) enabled and disabled.
- Calls between DMP 128 Plus and the PSTN.
- UDP transport protocol.
- Support of G.711 and G.729 codecs.
- Proper recognition of DTMF tones.
- Basic telephony features, including hold, mute, redial, multiple calls, conference, and long duration calls.
- Extended telephony features using Communication Manager FACs for Call Forward, Follow Me, Call Unpark, and Call Pickup.
- Proper system recovery after a restart of DMP 128 Plus and loss of IP connectivity.

2.2. Test Results
All test cases passed with the following observations noted:

- During the compliance test, the Phone Dialer tool, available through the Extron DSP Configurator, was used for placing and answering calls. The Phone Dialer is designed for basic test purposes only. Typically, customers would use the Extron CCI Pro 700 TouchLink Pro Conference Room Control Interface, or one of Extron's many other customizable touchpanel devices, which provides a more robust experience and audio tone feedback for each call.
- DMP 128 Plus does not support call transfer.
- DMP 128 Plus supported conferencing by configuring the DSP to automatically mix audio from all active call appearances.
- Only one codec should be configured on DMP 128 Plus for compatibility with Communication Manager.
- TLS/SRTP is not fully supported between DMP 128 Plus, Communication Manager, and Session Manager at this time. UDP transport over a clear line was used for audio calls.

2.3. Support
For technical support on the Extron DMP 128 Plus C V, contact the S3 Support Hotline via phone or website.

- **Phone:** +1 (800) 633-9876
3. Reference Configuration

Figure 1 illustrates a sample configuration with an Avaya SIP-based network that includes the following products:

- Avaya Aura® Communication Manager running in a virtual environment with an Avaya G450 Media Gateway. The Avaya G450 Media Gateway was connected to the PSTN via an ISDN-PRI trunk (not shown).
- Media resources in the Avaya G450 Media Gateway and Avaya Aura® Media Server.
- Avaya Aura® Session Manager connected to Communication Manager via a SIP trunk and acting as a Registrar/Proxy for SIP telephones.
- Avaya Aura® System Manager used to configure Session Manager.
- Avaya 96x1 Series H.323 and SIP Deskphones.
- Extron DMP 128 Plus C V, Extron DSP Configurator with Phone Dialer for establishing calls.

Extron DMP 128 Plus C V registered with Session Manager and was configured as Off-PBX Stations (OPS) on Communication Manager.

Figure 1: Avaya SIP Network with Extron DMP 128 Plus C V
4. **Equipment and Software Validated**

The following equipment and software were used for the sample configuration provided:

<table>
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<th>Release/Version</th>
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<td>Avaya Aura® Communication Manager</td>
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<td>Avaya G450 Media Gateway</td>
<td>38.20.1</td>
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<tr>
<td>Avaya Aura® Media Server</td>
<td>7.8.0.333</td>
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<td>Avaya Aura® Session Manager</td>
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<td>Avaya Aura® System Manager</td>
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<td></td>
<td>Feature Pack 1</td>
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<tr>
<td>Avaya 96x1 Series IP Deskphone</td>
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<tr>
<td></td>
<td>7.1.1.0.9 (SIP)</td>
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<tr>
<td>Extron DSP Configurator</td>
<td>2.18.0.10</td>
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5. Configure Avaya Aura® Communication Manager

This section provides the procedure for configuring Communication Manager. The procedure includes the following areas:

- Verify Communication Manager license
- Administer IP Network Region and IP Codec Set

Use the System Access Terminal (SAT) to configure Communication Manager and log in with appropriate credentials.

**Note:** It is assumed that basic configuration of Communication Manager has already been completed, such as the SIP trunk to Session Manager. However, implementers should ensure sufficient Maximum Administered SIP Trunks licenses are available to accommodate the traffic between Communication Manager and Session Manager. The SIP station configuration for Extron DMP 128 Plus C V is configured through Avaya Aura® System Manager in Section 6.2.

### 5.1. Verify License

Using the SAT, verify that the Off-PBX Telephones (OPS) option is enabled on the `system-parameters customer-options` form. The license file installed on the system controls these options. If a required feature is not enabled, contact an authorized Avaya sales representative.

On **Page 1**, verify that the number of OPS stations allowed in the system is sufficient for the number of SIP endpoints that will be deployed.

```
display system-parameters customer-options
```

<table>
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<tr>
<th>OPTIONAL FEATURES</th>
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*NOTE: You must logoff & login to effect the permission changes.*
5.2. Administer IP Network Region and IP Codec Set

In the IP Network Region form, the Authoritative Domain field is configured to match the domain name configured on Session Manager. In this configuration, the domain name is avaya.com. By default, IP-IP Direct Audio (shuffling) is enabled to allow audio traffic to be sent directly between IP endpoints without using media resources in the Avaya G450 Media Gateway or Avaya Aura® Media Server. The IP Network Region form also specifies the IP Codec Set to be used for calls routed over the SIP trunk to Session Manager.

In the IP Codec Set form, select the audio codec type supported for calls routed over the SIP trunk to DMP 128 Plus. The form is accessed via the change ip-codec-set 1 command. Note that IP codec set ‘1’ was specified in IP Network Region ‘1’ shown above. The default settings of the IP Codec Set form are shown below. DMP 128 Plus was tested using G.711 and G.729 codecs.
6. Configure Avaya Aura® Session Manager

This section provides the procedure for configuring Session Manager. The procedures include the following areas:

- Launch System Manager
- Set Network Transport Protocol for DMP 128 Plus
- Administer SIP User

Note: It is assumed that basic configuration of Session Manager has already been performed. This section will focus on the configuration of a SIP user for DMP 128 Plus.

6.1. Launch System Manager

Access the System Manager web interface by using the URL “https://ip-address” in an Internet browser window, where “ip-address” is the IP address of the System Manager server. Log in using the appropriate credentials.
6.2. Set Network Transport Protocol for Extron DMP 128 Plus

From the System Manager Home screen, select Elements → Routing → SIP Entities and edit the SIP Entity for Session Manager shown below.

Scroll down to the Listen Ports section and verify that the transport network protocol used by DMP 128 Plus is specified in the list below. For the compliance test, DMP 128 Plus used UDP network transport.
6.3. Administer SIP User

In the Home screen (not shown), select Users → User Management → Manage Users to display the User Management screen below. Click New to add a user.

6.3.1. Identity

The New User Profile screen is displayed. Enter desired Last Name and First Name. For Login Name, enter “<ext> @ <domain>”, where “<ext>” is the desired DMP 128 Plus SIP extension and “<domain>” is the applicable SIP domain name from Section 5.2. Retain the default values in the remaining fields.
6.3.2. Communication Profile
Select the Communication Profile tab. For Communication Profile Password and Confirm Password, enter the desired password for the SIP user to use for registration.

6.3.3. Communication Address
In the Communication Address sub-section, click New to add a new entry. The Communication Address sub-section is updated with additional fields as shown below. For Type, retain Avaya SIP. For Fully Qualified Address, enter and select the SIP user extension and domain name to match the login name from Section 6.3.1. Click Add.
6.3.4. Session Manager Profile

Scroll down to check and expand Session Manager Profile. For Primary Session Manager, Origination Application Sequence, Termination Application Sequence, and Home Location, select the values corresponding to the applicable Session Manager and Communication Manager. Retain the default values in the remaining fields.
6.3.5. CM Endpoint Profile

Scroll down to check and expand **CM Endpoint Profile**. For **System**, select the value corresponding to the applicable Communication Manager. For **Extension**, enter the SIP user extension from **Section 6.3.1**. For **Template**, select `9600SIP_DEFAULT_CM_7_0`. For **Port**, click and select `IP`. Retain the default values in the remaining fields. Click the Endpoint Editor to configure the appropriate number of call appearances.

- **System**: devcon-cm
- **Profile Type**: Endpoint
- **Extension**: 78020
- **Template**: 9600SIP_DEFAULT_CM_7_1
- **Set Type**: 9600SIP
- **Security Code**: 
- **Port**: IP
- **Voice Mail Number**: 
- **Preferred Handle**: (None)
- **Calculate Route Pattern**: 
- **Sip Trunk**: aar
- **Enhanced Callr-Info display for 1-line phones**: 
- **Delete Endpoint on Unassign of Endpoint from User or on Delete User**: 
- **Override Endpoint Name and Localized Name**: 
- **Allow H.323 and SIP Endpoint Dual Registration**: 
Navigate to the **Button Assignments** tab and configure four call appearances as shown below. DMP 128 Plus was configured with four call appearances in **Section 7.4**. Click **Done** to return to the previous web page and then **Commit** to save the configuration (not shown).
7. Configure Extron DMP 128 Plus C V

This section provides the procedures for configuring DMP 128 Plus. The procedures fall into the following areas:

- Launch Web Interface
- Administer Network Settings
- Administer SIP Settings
- Configure the DSP

7.1. Launch Web Interface

DMP 128 Plus was configured via the web interface by using the URL “https://ip-address/www.voip.html” in an Internet browser window, where “ip-address” is the DMP 128 Plus IP address. The web page displayed in the following section is displayed.

7.2. Administer Network Settings

To configure IP network settings, navigate to Network → Interface and configure the LAN 1 settings. For the compliance test, a static IP address, 192.168.100.230, was assigned to DMP 128 Plus as shown below. Alternatively, DHCP may be used. Click Apply.

![Network Settings Configuration](image-url)
7.3. Administer SIP Settings
To configure SIP settings, select the **Network** tab followed by the **Transport** sub-tab. Click **Configuration** and then select the **SIP** tab. Configure the following fields:

- **Transport** Specify the *UDP* transport protocol.
- **Listening Port** Specify port 5060.
- **Use Secure RTP (AES CTR)** Disable SRTP.

Click **Apply**.
Navigate to **Line 1** tab to configure the SIP registration settings. Configure the following fields:

- **User Name**
  Specify the SIP extension configured on Session Manager.

- **Authentication User Name**
  Specify a user name.

- **Authentication Password**
  Specify the SIP password used to register with Session Manager.

- **Display Name**
  Provide a display name.

- **Primary Proxy Name/IP**
  Specify the Session Manager IP address (10.64.102.117).

- **Primary Proxy Port**
  Specify SIP port 5060.

Click **Apply** to submit the changes and then click the **Register** button to register DMP 128 Plus with Session Manager after all the configuration is in place.
In the **Audio** sub-tab, specify the desired codec, G.711 and G.729, but not both. Refer to the note on codec negotiation in Section 2.2. Click **Apply**.
In the **Dialing** sub-tab, accept the default settings shown below.

![Dialing Settings](image)

### 7.4. Configure the DSP

Although the DSP configuration is outside the scope of these Application Notes, the following information is provided for informational purposes only.

Launch the **DSP Configurator**, select **Connect…** in the drop-down field, and click **OK**.

![DSP Configurator](image)
In the **Connect to device…** window shown below, enter the DMP 128 Plus IP address in the **Hostname or IP Address** field and click **OK**.
Once connected to DMP 128 Plus, the **DSP Configurator** is displayed as shown below.
Scrolling down shows that four call appearances were configured for the SIP line and that the audio call appearances were mixed together. This results in all calls being conferenced together automatically.
Calls were originated and answered using the **Phone Dialer** accessible from the **DSP Configurator** menu (i.e., **Tools → Phone Dialer**). Typically, the **Extron CCI Pro 700 TouchLink Pro Conference Room Control Interface** would be used by customers for this purpose, which would provide audio tone feedback for each call.
8. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Aura® Communication Manager, Avaya Aura® Session Manager, and Extron DMP 128 Plus C V.

1. Verify that DMP 128 Plus has successfully registered with Session Manager. In System Manager, navigate to Elements → Session Manager → System Status → User Registrations to check the registration status.

2. Alternatively, the registration status may be viewed on the DMP 128 Plus web interface in the Registration tab or in the Phone Dialer shown on the next page.
3. Verify basic telephony features by establishing calls between DMP 128 Plus and local phones.
9. Conclusion

These Application Notes described the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya Aura® Communication Manager and Avaya Aura® Session Manager. Extron DMP 128 Plus C V was able to establish calls with H.323 stations, SIP stations, and the PSTN. In addition, basic telephony features were verified. All feature and serviceability test cases were completed successfully with observations noted in Section 2.2.

10. References

This section references the Avaya and Extron documentation relevant to these Application Notes. The Avaya product documentation is available at http://support.avaya.com and the Extron documentation is available at https://www.extron.com.

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