**Purpose of this document**

The purpose of this document is to explain how CICS SMF data can be loaded by CICS PA into DB2 to enable new and experienced CICS performance specialists to use the rich analysis, data filtering, and data visualisation capabilities provided by the CICS PA plug-in.

To use all the capabilities the CICS PA plug-in provides you will need to load the following CICS SMF data:

- CICS Monitoring Facility (CMF) Performance class data (SMF Record type 110 subtype 1)
- CICS TS Statistics data (SMF Record type 110 subtype 2)
- CICS TG Statistics data (SMF Record type 111 subtype 1)

**Assumption:**

The assumption we start with is that you know how to use CICS PA. If not, you need to work through the CICS PA Getting Started Guide. This provides all the details on how to use the ISPF dialogues of CICS PA to generate and run reports as well as loading data into the Historical Database (HDB) and exporting it to DB2.

The next assumption is that you have installed the CICS Explorer and CICS PA plug-in to the point where you need to define the connection details for the PA plug-in.

The final assumption is that you have the required details of the DB2 system where you want to load the DB2 data.

**Data you need to load:**

To enable the CICS PA plug-in to identify performance bottlenecks and tuning considerations for your CICS TS and CICS TG environments you need to load the CICS TS and CICS TG Statistics Alert data as well as the Statistics data associated with the alert.

To enable the CICS PA plug-in to identify performance bottlenecks and tuning considerations for your CICS transactions you need to load CMF Performance alert data and the CMF Performance list data associated with the performance alerts. To use the performance alert function of CICS PA, you need to be running at CICS PA V5.2 or later.

The CMF Performance Summary data needs to be loaded to enable the CICS PA plug-in to analyse Performance summary data and provide visualisation and analysis of the CMF performance class data summarised according to the summary interval you specify on the HDB template or the HDB definition. To be able to specify the summary interval at the HDB level, you need to be running at CICS PA V5.2 or later.
Review CICS PA setup

Before you start loading data, you need to review the your CICS PA setup.

1) **DB2 Settings** (Option 0.4 from the **CICS Performance Analyzer - Primary Option Menu**). Contact to your DB2 Database Administrator (DBA) and ensure the following details are filled in. See example below:

2) Review the CICS TS and CICS TG version numbers on the **Historical Database Menu** panel (Option 5 from the **CICS Performance Analyzer - Primary Option Menu**). It is important for you to specify the correct versions, as the DB2 tables created when you export the statistics HDB data are based on the versions of CICS TS and CICS TG that you specify here. See example below:
Loading data for Statistics Alerts

CICS PA statistics alerts help you highlight performance issues related to the way your CICS system are performing and/or configured. Before you can review and analyze the CICS Statistics alerts and the related data, you need to load the statistics alert data and the related statistics data.

a) First, we need to create a Statistics Alert definition. You can use one of the supplied statistics alert samples as a template for your statistics alert definition. From the CICS Performance Analyzer - Primary Option Menu panel, select Option 8, Resource Definitions and press ENTER.

b) On the Resource Definitions Menu panel, select Option 5, Statistics Alerts and press ENTER.
c) On the command line on the **Statistics Alert Definitions** panel, type in **new** followed by the name of the statistics alert definition you want to create. In the example below, we have called it **ctsalr1**. Then press ENTER.

![Command line with new command](image)

**On the command line on the Statistics Alert Definitions panel, type in new followed by the name of the statistics alert definition you want to create.**

d) On the **New Statistics Alert definition** panel, select the option, **Initialize with sample scenarios**, and press ENTER.

![New Statistics Alert definition panel](image)

**On the New Statistics Alert definition panel, select the option, Initialize with sample scenarios, and press ENTER.**
e) On the **Sample Alert Definitions** panel, select the “CTSKEY CICS TS Key System Sample Alerts” sample alert definition as the template for your statistics alert definition and press **ENTER**.

On the **EDIT Statistics Alert Definition** panel, review the alert definitions to ensure they have appropriate threshold values for your CICS systems.

f) Type **SAVE** on the command line and press **ENTER** to save the alert Names, Thresholds, and Formula in the statistics alert definition (or press **PF3** to **SAVE** and **EXIT**).
Next you need to define a statistics HDB and reference the statistics alert definition you just created. From the CICS Performance Analyzer - Primary Option Menu panel, select Option 5, Historical Database and press ENTER.

g) On the Historical Database Menu panel, check you have the correct VRM (Version, Release, and Modification) settings specified for the CICS TS and CICS TG systems that you are loading Statistics data for. Then select Option 2, Define and press ENTER.

h) From the New HDB Definition Menu panel, select option 2. Statistics – CICS Statistics for a statistics type HDB and press ENTER.
i) On the **New HDB Definition** panel, specify the name of the HDB, this can be anything meaningful such as DEVSTAT1.

j)  
1. Specify the **Qualifier**; we’ve used the Qualifier CPAHDB52 in this example that will be used to create the DB2 tables. Make a note of this Qualifier as you will also need to specify the same Qualifier when you define your CICS PA plug-in connection.
2. You also need to select the **Explorer** option as this HDB is being used to load data for the CICS PA plug-in to the CICS Explorer.
3. Press **PF4** with the cursor on the Alert field and select the statistics alert definition you created earlier.
4. Review the **Data Retention Period** for the HDB you are defining. If you are using this HDB just to load data to DB2, you can specify a retention period of 0 to make the HDB data sets expire immediately.
5. Put a / in the **Select to specify Statistics Reports** field and press **ENTER**.
6. Check the statistics **Interval Type** settings. You may want to select only a subset of the statistics Interval Types to reduce the amount of data you have to load into the HDB and DB2.
k) On the **Statistics Reports** panel, use the **a** and **al** line commands on the **CICS Performance Analyzer – CICS TS** Alert field to activate collection of the data into the HDB and DB2 loading of the alert data as well. See examples below. **Note:** If you want to activate collection and DB2 load for CICS TG Statistics alerts, you will need to scroll down to them and activate them in the same way.
1) Press PF3 twice to save the HDB definition.

Next, you need to load the SMF data into this HDB. From the Historical Database Menu panel, select Option 3, Load and press ENTER.
m) From the Load HDBs panel, select the HDB you defined earlier and press ENTER.

n) On the Load STATS HDB panel, specify the Applid, Image, or Group of systems for which you want to load CICS Statistics data into the statistics HDB.

1. Note the DB2 Export options. You can choose this in option if you want CICS PA to generate the JCL for the HDB load and the DB2 export in one job. For our purposes, we will complete these steps separately.
2. Leave the rest of the options on this panel as they are and press ENTER.
3. “Press ENTER to proceed with request.” as directed on the panel.
The Load Stats HDB JCL will be generated as shown below. You can now submit this JCL and also save the JCL as a member of a Partitioned Data Set (PDS) for future use to load more statistics data into the HDB. For example, to be executed as part of your daily CICS SMF data processing.

Review the HDB load job output to make sure that the HDB data set (container) has been created and loaded successfully.
p) Next, you need to Export the HDB data to DB2. From the Historical Database Menu panel, select **Option 5, Export** and press ENTER.

q) From the Export HDBs panel, select the HDB you loaded earlier and press ENTER.
r) From the **Export STATS HDB** panel, select the Data Set Name (container) you want to Export to DB2 and press ENTER. **Note:** You can select multiple containers to Export in one job.

s) Next, on the Statistics Reports panel, type in the ss line command on the “**Report**” line and press ENTER.
t) On the Export HDB Data Set panel, as this is the first time you are Exporting data to DB2, you need to select the Option 1. Create DDL to define table. At this point you may need to contact your DBA to check if you need to select the option to create the database and storage group as they may want to create these in a separate step.

Leave the rest of the options on this panel as they are and press ENTER.

“Press ENTER to proceed with request.” as directed on the panel.

u) The DB2 Create table JCL will be generated as shown below. You can submit this JCL and also save the JCL as a member of a PDS for future use or to send to your DBA.

Once the “Create DDL to define table” JCL has been submitted and executed, review the 'define table' job output to make sure that the statistics tables were created successfully.
v) Having created the DB2 tables, you can select the Export option 5 again from the Historical Database Menu panel. Select the HDB, the dataset to export and type in the `SS` command to select the statistics reports to Export. This time on the Export HDB dataset panel, however, select option 2, Load data into table.

The “Load data into table” JCL will be generated as shown below. You can submit this JCL and also save the JCL as a member of a PDS for future use or to send to your DBA.

Once the JCL has been submitted and the job has executed, review the table load job output to make sure that the statistics tables were created successfully.
Having loaded the statistics data into the DB2 tables, the next step is to create the Manifest table. The Manifest table is a look-up table used by the CICS PA plug-in to access the data in all the DB2 tables you loaded. From the **Historical Database Menu** panel, select **Option 5, Export** and press **ENTER**. On the **Export HDBs** panel, place your cursor on the Explorer option in the Action Bar at the top of the panel and press **ENTER**.

Select **Option 1, Manifest Maintenance** (it's the only available option) and press **ENTER**.
y) On the Manifest Maintenance panel, check that you have the correct setting for the Qualifier name that you have been using to load your DB2 tables. If this is the first time you are creating the Manifest, make sure the Create Tablespace option is also selected. Then press ENTER.

Now “Press ENTER to proceed with request.” as directed on the panel. The Manifest table create and load JCL will be created as shown below.

You can submit this JCL if you have the required authority to create the Tablespace and Table or you can save it the JCL as a member of a PDS for your DBA to submit.

Once the Manifest table has been created and loaded, you can define your CICS PA plug-in connection.
Performance Analyzer Connection

See example below. You will need details of the Location Host name and Port number, and DB2 Location from your DBA. Specify the Schema (Qualifier) you used when creating and loading the tables earlier.
Loading data for Performance Alerts

CICS PA Performance Alerts can help you highlight performance issues related to the way your CICS applications and transactions are running. Before the CICS PA plug-in can analyze the Performance Alerts and the related data, you need to load the CMF performance alert data and the related CMF performance list records.

a) Create a Performance Alert definition. From the CICS Performance Analyzer - Primary Option Menu, select Option 8, Resource Definitions and press ENTER.

b) On the Resource Definitions Menu panel, select Option 3, Performance Alerts and press ENTER.
c) On the Performance Alert Definitions Menu panel, type in new PERFALR1 on the command line and press ENTER.
d) This is the **EDIT Performance Alert Definition Template** panel. You can customise this to include the fields you want to set thresholds for. For example: If you only want to define CRITICAL and WARNING thresholds for RESPONSE time, the template would look something like this.

```
<table>
<thead>
<tr>
<th>Field</th>
<th>Sort</th>
<th>Type</th>
<th>Function</th>
<th>Severity Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>TASKCNT</td>
<td>K</td>
<td>A</td>
<td>RESOURCE</td>
<td></td>
</tr>
<tr>
<td>ALERT</td>
<td></td>
<td>SEV</td>
<td>CRITICAL</td>
<td>PERCENT</td>
</tr>
<tr>
<td>ALERT</td>
<td></td>
<td>SEV</td>
<td>WARNING</td>
<td>PERCENT</td>
</tr>
<tr>
<td>RESPONSE</td>
<td></td>
<td>SEV</td>
<td>CRITICAL</td>
<td>PERCENT</td>
</tr>
<tr>
<td>RESPONSE</td>
<td></td>
<td>SEV</td>
<td>WARNING</td>
<td>PERCENT</td>
</tr>
<tr>
<td>EOR</td>
<td></td>
<td>MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EOX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPLID</td>
<td>K</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

e) Once you have decided on which fields and severities you want to include in the template, press **PF3** to save the template. Select, **Confirm save** on the next panel and press **ENTER** to save the alert template.
f) You can now start specifying thresholds for the fields you included in the alert template. From the **Performance Alert Definitions** panel, select the alert template you created and press **ENTER**.

![Performance Alert Definitions panel](image1.png)

On the **EDIT Performance Alert Values** panel, you can specify the threshold definitions for your transactions as shown in the example.

![EDIT Performance Alert Values panel](image2.png)
h) Press **PF3** to SAVE your Performance Alert definition. You can now use this performance alert definition on a Performance CMF List HDB to enable performance alert data and the related performance list data to be loaded and exported to DB2.

i) To do this, you first need to define a CMF Performance List HDB.

j) From the **CICS Performance Analyzer - Primary Option Menu**, select **Option 5, Historical Database** and press ENTER.

k) From the **Historical Database Menu** panel, select **Option 2, Define** and press ENTER.
1) On the **New HDB Definition Menu** panel, select option 1. **Performance - CMF List or Summary** and press **ENTER**.

![New HDB Definition Menu panel](image)

m) On the **New HDB Definition** panel, specify a name for this CMF Performance List HDB.

1. Make sure the **Qualifier** you specify here is the same as the one you used for the Statistics HDB.
2. Make sure the **Explorer** option is selected.
3. Under **Load Options**, make sure you select LIST template for the release of CICS TS you are loading data for.
4. Specify the name of the performance alert definition you created earlier. You can use PF4 to get a list of alert definitions.
5. Also select the **Severity** of the alert you want CICS PA to use when loading records into the HDB. For example, you may only want to load data for ELIGIBLE transactions, i.e. only the performance records that match the performance alert definition.
Press PF3 to SAVE the HDB definition. The next step is to load the CMF Performance alert and CMF Performance List data into this HDB. So, from the Historical Database Menu panel, select Option 3, Load and press ENTER.
o) On the **Load HDBs** panel, select the CMF Performance List HDB you defined earlier and press **ENTER**.

p) On the **Load LIST HDB** panel, specify the APPLID, Image, or Group of regions that you want to load data for.
q) Press ENTER to generate the Load HDB JCL. Submit this JCL and review the output. You may want to save this JCL as a member of a PDS for reuse and inclusion in your job scheduler.

Having loaded the performance data into the HDB, you now need to Export this data to DB2. From the Historical Database Menu panel, select Option 5, Export and press ENTER.

r) On the Export HDBs panel, select the HDB you loaded and press ENTER.
s) On the Export LIST HDB panel, select the Data Set Name(s) (container) you want to Export. Note: That the performance LIST container data set name ends with HDB and the performance alert container data set name ends with HPA. You can select multiple containers to export as long as they are of the same type. You cannot Export a mix of HPA and HDB container types in one step.

1) Press ENTER. On the Export HDB Data Set panel, first select Option 1. Create DDL to define table.

Note: You may need to contact your DBA to find out if you need to create the Database and Storage Group or if this is something that is only done by DBAs within your organisation.
u) Press ENTER twice to generate the create table JCL. Submit this JCL and review the output. Once the table has been created, you can invoke the Export option again and this time, select Option 2. Load data into table.

v) Press ENTER twice to generate the load table JCL. Submit this JCL, execute the job, and review the output.

The table load steps needs to be performed for each of Performance List HDB containers you loaded.

Once the CMF Performance List data and CMF Performance Alert data has been loaded, you need to regenerate the Manifest table as you did previously. This will update the Manifest table with details of the two new tables you have loaded.
You can check access to these tables using the CICS PA plug-in connection you created previously.

**Loading data for Performance Summary**

CICS PA Performance Summary data can be used to analyze and visualize the performance of your CICS applications summarized over intervals that you specify. Before you can analyze the data, you need to load the data into an HDB and export it to DB2.

a) From the **CICS Performance Analyzer - Primary Option Menu** panel, select **Option 5. Historical Database** and press **ENTER**.

![CICS Performance Analyzer - Primary Option Menu](image1)

b) From the **Historical Database Menu** panel, select **Option 2. Define** and press **ENTER**.

![Historical Database Menu](image2)
c) On the **New HDB Definition Menu** panel, select Option 1 for a **Performance - CMF List or Summary** HDB type and press **ENTER**.

![New HDB Definition Menu panel](image)

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**d)** On the **New HDB Definition** panel, specify a name for this CMF Performance Summary HDB.

1. Make sure the Qualifier you specify is the same as the one you used for the Statistics HDB.
2. Make sure the Explorer option is selected.
3. Under Load Options, make sure you select the SUMMARY template for the release of CICS TS you are loading data for.
4. Specify the Summary interval you want the data to be summarized by.

![New HDB Definition panel](image)
e) Press PF3 to SAVE the HDB definition. The next step is to load the CMF Performance data into this HDB. From the Historical Database Menu panel, select Option 3, Load, and press ENTER.

f) On the Load HDBs panel, select the CMF Performance Summary HDB you defined, and press ENTER.
g) On the **Load SUMMARY HDB** panel, specify the Applid, Image, or Group for the CICS regions you want to load performance data for. Press **ENTER** twice to generate the HDB load JCL.

Submit this JCL, execute the job, and review the output. **Note:** That you can save this JCL as a member of a PDS for reuse and inclusion in your automation.

Having loaded the data into the HDB, you now need to export it to DB2. From the **Historical Database Menu** panel, select **Option 5, Export**, and press **ENTER**.

h) On the **Export HDBs** panel, select the HDB you loaded and press **ENTER**.
i) On the **Export SUMMARY HDB** panel, select the Summary HDB container you want to load, and press **ENTER**. **Note:** You can select multiple containers to export in one job.

![Image of Export SUMMARY HDB panel]

**Note:** You can select multiple containers to export in one job.

j) On the **Export HDB Data Set** panel, select option 1. **Create DDL to define table.**

**Note:** You may need to contact your DBA to find out if you need to create the Database and Storage Group or if this is something that is only done by DBAs within your organisation.

Press **ENTER** twice to generate the create table JCL. Submit this JCL and review the output. Once the table has been created, you can invoke the Export option again and this time, select option 2. **Load data into table.**

The table load steps needs to be performed for each of Performance List HDB containers you loaded.

Once the CMF Performance Summary data has been loaded, you need to re-generate the Manifest table as you did previously. This will update the Manifest table with details of the new Performance Summary table you have loaded.

You can check access to these tables using the CICS PA plug-in connection you created previously.
Automating the HDB load and DB2 Export process

You can now create the JCL for the HDB load and DB2 export process to enable this JCL to be included in your overnight batch process. To do this, you first need to create a Report Set to include the HDBs you have created.

a) On the CICS Performance Analyzer - Primary Option Menu panel, select Option 2, Report Sets and press ENTER.

b) On the Report Sets panel, type in new smf2db2, and press ENTER. Note: We have used smf2db2 as the name of the Report Set but you can specify whatever name you consider appropriate.
c) On the **Report Set** panel, select option **HDB Load** under the **Extracts** category and press **ENTER**.

![Screenshot of Report Set panel]

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d) On the **HDB Load** panel, put the cursor on the **HDB** option and press **PF4** to see the list of HDBs you created earlier and select one. Specify the APPLID, Image, or Group for the CICS Systems you want to load data for. Also, make sure you have the **Load DB2 Table** option selected.

![Screenshot of HDB Load panel]
e) Press PF3 to SAVE the Report Set. On the HDB Loads panel, type in r (for Repeat) next to the first report and press ENTER.

f) On the repeated line Press PF4 on the HDB + option and select the next HDB. Change the Recap name for this one to HDBL0002. Repeat the process and select the next HDB and change the Recap name for the next one to HDBL0003. The HDB Loads should now include all the HDBs you want to include in this Report Set. Press PF3 to SAVE the Report Set.
g) On the Report Set panel, type **RUN** next to the report set you just created and press **ENTER**.

![Image of Report Set panel]

h) On the Run Report Set panel, make sure the **Edit JCL before submit** option is selected. Press **ENTER**.

![Image of Run Report Set panel]
The HDB load and DB2 export JCL will be generated for the HDBs included in the Report Set. Review this JCL and save it as a member of a PDS for use as part of your automated batch runs.
**Product Alias/Synonym**

CICS PA  CICS Performance Analyzer for z/OS

CICS TG  CICS Transaction Gateway for z/OS

CICS TS  CICS Transaction Server for z/OS

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