How Avaya CMS stores ACD data

There are two ways to describe how Avaya Call Management System (CMS) stores ACD data:

- Logically – How the CMS system organizes data for processing
- Physically – How the CMS system mechanically stores the data on the disk drive

How Avaya CMS logically stores ACD data

The logical storage of the ACD data has more impact on the CMS user than does the physical storage. The logical data storage controls how a CMS user is able to access and manipulate ACD data. CMS stores all of the ACD data received from the switch in the real-time and historical databases.

Real-time databases

Real-time databases include tables for the current intrahour interval data and the previous intrahour interval data. The storage interval can be 15, 30, or 60 minutes.

Historical databases

Historical databases include tables for the intrahour, daily, weekly, and monthly data. The following table shows all of the historical database tables and the maximum amount of time data can be stored in a particular table:

<table>
<thead>
<tr>
<th>Historical database tables</th>
<th>Maximum time for data storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrahour historical data</td>
<td>62 days</td>
</tr>
<tr>
<td>Daily historical data</td>
<td>5 years (1825 days)</td>
</tr>
<tr>
<td>Weekly historical data</td>
<td>10 years (520 weeks)</td>
</tr>
<tr>
<td>Monthly historical data</td>
<td>10 years (120 months)</td>
</tr>
</tbody>
</table>

Note:

You can use historical data to predict future call traffic and future agent and trunk requirements. For more information see *Avaya CMS Forecast*, 585-215-717.
Data summarizing

When CMS collects data from the ACD, the data is stored in the real-time database for the current interval. At the end of the current interval, the following events occur:

- The data that was in current interval database table is archived to the previous interval database table.
- The data that was in previous interval database table is archived in the historical database as intrahour historical data.

The data remains in the historical database as intrahour historical data for a maximum of 62 days. At your designated data summarizing time, the intrahour historical data is summarized into daily historical data.

The daily historical data is summarized on a weekly and monthly basis. At the end of your designated week, the daily historical data is summarized into weekly historical data. On the first day of a new month, the daily historical data is summarized into monthly historical data for the previous month.

For more information, see CMS data storage on page 3.
CMS data storage

This figure shows how CMS stores data.

Real-time database
Current interval data
- Agent (cagent)
- Split (csplit)
- Trunk (ctrunk)
- Trunk group (ctkgrp)
- Vector (cvector)
- VDN (cvdn)
- Call Work Codes (ccwc)

Previous interval data
- Agent (pagent)
- Split (psplit)
- Trunk (ptrunk)
- Trunk group (ptkgrp)
- Vector (pvector)
- VDN (pvdn)
- Call Work Codes (pcwc)

Historical database
Intrahour historical data
- Agent (hagent)
- Split (hsplit)
- Trunk (htrunk)
- Trunk group (htkgrp)
- Vector (hvector)
- VDN (hvdn)
- Call Work Codes (hcwc)

Daily historical data
- Agent (dagent)
- Split (dsplit)
- Trunk (dtrunk)
- Trunk group (dtkgrp)
- Vector (dvector)
- VDN (dvdn)
- Call Work Codes (dcwc)

Weekly historical data
- Agent (wagent)
- Split (wsplit)
- Trunk (wtrunk)
- Trunk group (wtkgrp)
- Vector (wvector)
- VDN (wvdn)
- Call Work Codes (wcwc)

Monthly historical data
- Agent (magent)
- Split (msplit)
- Trunk (mtrunk)
- Trunk group (mtkgrp)
- Vector (mvector)
- VDN (mvdn)
- Call Work Codes (mcwc)
How Avaya CMS physically stores ACD data

The relational database used by CMS R3V9 and later is Informix Dynamic Server (IDS). IDS manages the CMS data in specific dbspaces. The historical database can span multiple disks. Each ACD dbspace contains the CMS historical database table for a single ACD.

In the following example:

- The dbspace acd1 contains the historical database table for ACD 1
- The dbspace acd2 contains the historical database table for ACD 2

**Dbspace**

A dbspace is a logical unit that consists of one or more chunks. Dbspaces can exist across multiple disks. A CMS system contains the following dbspaces:

- rootdbs
- physdbs
- logdbs
- dbtemp
- aasdbs
- cmsdbs
- freedbs
- acd1 through acd26

⚠️ **Important:**

Do not attempt to alter rootdbs, physdbs, logdbs, dbtemp, aasdbs, or cmsdbs. Contact CMS services if you think you have a problem with any of these dbspaces.
In the following example, the dbspace acd1 exists across multiple disks.

Chunks

A chunk is a unit of physical disk space used to store database data that is managed by IDS. Each chunk contains 256 MB of disk space. In the following example, the dbspace acd1 contains multiple chunks.
How Avaya CMS tracks ACD data

CMS uses the data in the real-time and historical databases to generate standard reports that help you monitor your contact center’s activities. Various agent, split/skill, trunk, trunk group, vector, and VDN activities are tracked at different points in the call process.

How CMS tracks a call

The following diagram shows how CMS tracks a call from the time the call seize a trunk until an agent ends after-call-work (ACW) activity.

The trunk table, trunk group table, vector table, VDN table, split/skill table, agent table, and call work code (CWC) table are CMS database tables that store call data. In the following diagram, the positions of the CMS database tables identify the points where CMS begins to collect call data. The arrowheads identify the points where data collection ends. The data is not recorded in the tables until the call and any ACW is complete.

Note:
With vectoring, the Stop command stops the processing of vector commands.
Events that start or stop data collection

Data collection starts or stops when one of these events occur:

- The Agent table starts collecting data on non-ACD calls when the agent answers or completes dialing.
- The Split/Skill table stops collecting data when:
  - The ACW for an ACD call ends
  - The call leaves the split queue and is forwarded to another destination (for example, intraflow)
  - The caller abandons the call
- The Vector table stops collecting data for the current vector when the call is:
  - Sent to an ACD agent
  - Connected to a station or trunk
  - Routed to a VDN or vector
  - Abandoned by the caller

  **Note:**
  
  Time in the vector stops but the vector tracks the call disposition to determine if the call was answered or abandoned.

- The VDN table stops collecting data for the current VDN when:
  - The ACW for an ACD call ends
  - The call is routed to a trunk or VDN
  - The call is transferred
  - The caller abandons the call
Things to consider when backing up or restoring data

Avaya recommends that you back up your CMS system data on a monthly basis and you back up your CMS ACD data on a daily basis. The backup tapes should be stored in a safe location, easily retrievable, correctly labeled, and replaced when worn out. Running system backups is no longer service affecting, but the backups will impact the performance of the CMS system. It is recommended that backups be run when CMS system activity is low.

*Things to consider when backing up or restoring data* presents several factors that will impact the amount of time it takes to back up or restore your data and presents options to reduce backup and restore times.

Factors that impact backup and restore times

The amount of time it takes to back up or restore data depends on the:

- **Amount of data** – An increase in the amount of data will cause an increase in the amount of time it takes to back up or restore the data. Some factors that will increase the amount of data being stored are:
  - Number of items being measured – CMS R3V9 and later have increased capacities. More data is generated if you measure 100,000 agent skill pairs instead of 10,000.
  - Number of days information is stored – The greater the data storage time, the greater the amount of data that will have to be backed up or restored. When the CMS system reaches a predetermined threshold for data storage, the oldest record is deleted so that the newest record can be stored. Twice the amount of data is stored if you set your data storage for 62 days instead of 31 days.
  - Interval size – Shorter intervals generate more data. A 15 minute interval will generate significantly more data than a 60 minute interval.

- **System load** – Processes that require a large amount of system resources will slow down the CMS system. Backing up data requires a large amount of system resources. Additional processes that require a large amount of system resources are:
  - Running reports – Running a single large report or multiple smaller reports will use a large amount of system resources.
  - Archiving data – Archiving a large amount of data will use a large amount of system resources.

- **Necessity for manually changing backup tapes** – If the amount of data exceeds the capacity of a single backup tape, someone must monitor the system and manually load additional tapes. A data backup or restore will not finish unless someone is able to load tapes into the tape device as needed.
Things to consider when backing up or restoring data

The following table provides some examples of how the amount of data and the system load will impact the amount of time it takes to backup your data. You will see some variation in these values depending on your platform type and configuration.

<table>
<thead>
<tr>
<th>Platform running CMS R3V11</th>
<th>System load (%)</th>
<th>Interval time (minutes)</th>
<th>Agent skill pairs</th>
<th>Data storage (GB)</th>
<th>Data backup time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra 5</td>
<td>0</td>
<td>30</td>
<td>32,000</td>
<td>41.5</td>
<td>15.75</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td>19.87</td>
</tr>
<tr>
<td>Sun Blade 100</td>
<td>0</td>
<td>30</td>
<td>50,000</td>
<td>64.25</td>
<td>21.03</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td>30.76</td>
</tr>
</tbody>
</table>

Reducing tape backup and restore times

If you do not take steps to optimize your CMS backup and restore times, you will begin to experience performance issues. Your CMS system performance will drop if the backup continues to run when contact center activity increases. With the increased CMS capacities that are now available, CMS backups and restores could take much longer to complete than they have in the past. To reduce the amount of time it takes to backup or restore data, you can:

- Select the maximum interval time that will meet your data collection needs.
- Select the minimum data storage times that will meet your data collection needs for all the historical database tables.
- Run reports when the CMS system is not actively backing up or restoring data.
- Schedule routine backups to occur at a time that is different from data archiving.
- Schedule routine backups to occur when CMS system activity is low.
- Reduce the amount of data being stored so only one backup tape is needed to store the data.
- Upgrade your CMS system to a more powerful hardware platform or add additional memory and CPUs.
Alternate methods for backing up and restoring data

If you need a higher capacity process for backing up and restoring your data, you may want to use the Avaya CMS LAN Backup feature. The Avaya CMS LAN Backup feature provides an alternative to the traditional method of backing up and restoring data with a tape device. LAN Backup allows you to back up CMS data and system information over a local area network (LAN) to a storage manager.