



Avaya Call Management System Capacities

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Chapter 1: Avaya CMS capacities

This document describes the supported hardware platforms and capacities for the Avaya Call Management System (CMS) Release 17 (R17), Release 17 R2 (R17 R2), Release 17 R3 (R17 R3), and Release 17 R4 (R17 R4) software that can currently be purchased from Avaya.

This document includes the following topics:

- [Using the capacity limits](#) on page 7
- [Capacity descriptions](#) on page 7
- [CMS R17, R17 R2, R17 R3, and R17 R4 Capacities](#) on page 10
- [Optimizing CMS reporting efficiency](#) on page 14

Using the capacity limits

The capacities described in the following topics are the maximum limits that can be supported by a particular CMS hardware platform. You must verify that *none* of the capacity limits is exceeded for a particular hardware platform.

If you exceed even one of the capacity limits for a given hardware platform, you require the next higher capacity hardware platform. For example, if you have less than 200,000 calls per hour, but between 201 and 400 Supervisors, you must purchase a Dell R720 server.

Capacity descriptions

The following topics describe the measurements you must use to determine which CMS hardware platform is required.

Peak busy hour call volume

The busy hour call volume capacity is the call volume during the busiest hour of the day.

Calculate the busy hour call volume by adding each trunk seizure or line appearance seized during the busiest hour for all calls.

Concurrent supervisors

The concurrent supervisors capacity is the total maximum number of CMS supervisors and CMS terminal emulator logins that exist during the peak busy hour. The concurrent supervisors capacity is not the number of authorized logins, but the number of logins actually used.

Note:

This capacity limit is the sum of the login count from each client type: CMS Supervisor PC client, CMS Supervisor Web client and CMS Supervisor PC Client, Terminal Emulator, and Network Reporting.

Calculate the number of concurrent supervisors by counting the maximum number of supervisor logins and terminal emulator logins that exist during the busy hour period. Each login counts as one. Do not count the number of reports. This calculation must be 1600 or less.

Third-party software

The third-party software capacity is the number of external or third party interface applications. Some examples of third-party interfaces are Blue Pumpkin, ODBC, wallboards, Geotel, Operational Analyst, TCS, and IEX.

Calculate the amount of third-party software by counting the number of third party applications used.



Important:

The one exception to this rule is Geotel, which counts as two applications.

Do not count each instance of the application. If you use wallboards, count the wallboards as one application. Do not add up the total number of wallboards.

Agent/skill pairs

The agent/skill pairs capacity is the total number of agent/skill pairs.

Calculate this capacity by multiplying the number of agents by the number of skills each agent can log in to. The number of agents and the number of skills are based on the switch administration. For example, if there are 20 agents, and each agent is administered with 5 skills, you would multiply agents by their skills for a value of 100 agent/skill pairs. You must count the total number of skills administered for the agent, not the number of skills used by the agent.

Reports per Supervisor session

The reports per Supervisor session capacity is the average number of simultaneous real-time reports each supervisor will run.

Report elements

The report elements capacity is the average number of report elements.

A report element is an entity that is monitored by an average real-time report. Report elements are not the lines of data rendered on the report but the element that is chosen to run the report against. Some examples of elements are VDNs, skills, and vectors.

Calculate this capacity by counting each element. You would count one element if a report is run for one skill. It does not matter if the report has lines of data for each agent in the skill.

Active agent traces

The active agent traces capacity is the number of agent traces running on the CMS.

Average refresh rate

The average refresh rate capacity is the average refresh rate for real-time reports.

Calculate this capacity by averaging the refresh rates set by your report users. For example, if one-half of the users use a 30-second refresh rate, and the other half use a 10-second refresh rate, you would calculate an average of 20.

Percent refresh rate at three seconds

The percent refresh rate at 3 seconds capacity is the percentage of real-time report users that require a refresh rate of 3 seconds.

CMS R17, R17 R2, R17 R3, and R17 R4 Capacities

The following tables list the capacities for each hardware platform being sold for the new CMS R17 installations or for the existing platforms being upgraded to CMS R17. Only T5120, T5220 and Netra X4270 systems can be upgraded to R17.

New shipments

Capacity	R17 Low End Hardware Platform (Dell R620 low)	R17 Midsize Hardware Platform (Dell R620 mid)	HP 380P G8	R17 R2 High End Hardware Platform (Dell R720)
Memory	8GB	16GB	64GB	64GB
Peak busy-hour call volume	10,000	200,000	400,000	400,000
Concurrent supervisors ¹	30	200	1,600	1,600
Concurrent Agents	400 ²	5,000	10,000	10,000
Third-party software	3	3	7	7
Agent skill pairs ³	100,000	200,000	200,000	800,000 ²
Reports per Supervisor session	5	5	10	10
Report elements	5	5	12	12
Active agent traces	200	1,000	5,000	5,000
30 seconds Average refresh rate	10% at 3 seconds	50% at 3 seconds	100% at 3 seconds	100% at 3 seconds
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins
External Call History (ECH) records	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins

1. The total capacity of concurrent CMS Supervisors is the combined capacity of CMS Supervisor PC clients, CMS Supervisor Web clients, and CMS Supervisor Mobile clients.

2. This concurrent agent capacity is effective in CMS R17 R4 in the ASD configurator.

3. CMS supports a system wide limit of 800,000 agent skill pairs, with a per ACD limit of 100,000 agent skill pairs. See [Maximum values with multiple ACD deployment](#) for more information.

The Dell R720 introduces new CMS system wide capacities. The new CMS system wide capacities come with restrictions, so review [Maximum values with multiple ACD deployment](#) for specific restrictions when using the higher system wide capacities.

Note:

All the per ACD capacities remain unchanged.

New system wide capacities

CMS attribute	System wide capacity	Per ACD capacity
Agent skill pair	800,000	100,000
Total VDNs	54,000	30,000
Total splits or skills	54,000	8,000
Total trunks	40,000	12,000
Total trunk groups	8,000	2,000
Total vectors	32,000	8,000
Total call work codes	4,000	1,999
Agent trace records (AAR)	5,100,000	5,100,000

The following table represents the maximum values with multiple ACD deployment on a Dell R720 system supporting 800,000 agent skill pairs:

Maximum values with multiple ACD deployment

Basic Maximum Values					
Agent/skill pairs	300,000	300,000	400,000	500,000	800,000
Interval length (30)	30	15	30	30	30
Interval data days saved	31	31	15	31	15
Daily data days saved	1,825	730	1,825	730	730

Note:

There is no impact on daily, weekly, and monthly limits. When the capacity limit of agent skill pairs crosses 200,000, there is an impact on the interval data storage.

Upgrades

Capacity	Netra X4270	Sun Enterprise T5120 4-core	Sun Enterprise T5220 or T5120 8-core		SPARC T4-1	
Memory	4GB	4GB or 8GB	16GB	32GB	32GB	64GB
Peak busy-hour call volume	200,000	200,000	250,000	400,000	400,000	400,000
Concurrent supervisors ¹	200	200	400	800	800	1600
Concurrent Agents	5,000	5,000	10,000		10,000	
Third-party soft- ware	3	3	5	7	7	7
Agent skill pairs ²	200,000	200,000	200,000		200,000	
Reports per Supervisor session	5	5	8	10	10	10
Report elements	5	5	8	12	12	12
Active agent traces	200	200	400	600	2,000	5,000
30 seconds Average refresh rate	10% at 3 seconds	10% at 3 seconds	50% at 3 seconds	100% at 3 seconds	100% at 3 seconds	100% at 3 seconds
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins		4,000 per 20 mins	
External Call History (ECH) records	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins		300,000 per 20 mins	

1. The total capacity of concurrent CMS Supervisors is the combined capacity of CMS Supervisor PC clients and CMS Supervisor Web clients.

2. CMS supports a system wide limit of 200,000 agent skill pairs, with a per ACD limit of 100,000 agent skill pairs.

Capacities in a VMWare configuration

Parameter	Small VMWare configuration No equivalent real hardware machine	Medium VMWare configuration — about equivalent to mid-sized Dell R620 with Linux	Large VMWare configuration — about equivalent to high-end Enterprise T4 with Solaris
Peak busy-hour call volume	30,000	200,000	400,000
Concurrent supervisor sessions ¹	50	200	1,600 ²
Concurrent Agents	500	5,000	10,000
Third-party software	3	3	7
Agent skill pairs ³	100,000	200,000	200,000-R17.0 R1 800,000-R17.0 R2 ³
Reports per Supervisor session	3	5	10
Report elements	5	5	12
Percentage of supervisors that can run reports with a 3 second refresh rate	0%	50%	100%
Active agent traces	250	1,000	5,000
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins
External Call History (ECH) records	10,000 per 20 mins	60,000 per 20 mins	300,000 per 20 mins

1. This value is the total number of active CMS Supervisor PC client and CMS Supervisor Web client sessions.

2. Of the 1600 sessions supported, only 800 can be CMS Supervisor Web client sessions.

3. Supporting 800,000 agent skill pairs requires greatly increased disk space for interval data. Customers should create up to 8 additional disk volumes. See *Deploying Avaya Call Management System in an Avaya Customer Experience Virtualized Environment* for full details on disk space usage recommendations.

Optimizing CMS reporting efficiency

Avaya provides a powerful solution with CMS that enables you to create custom reports designed to fit your individual needs. However, the overall capability of the CMS server is limited by the memory and CPU of each server.

This section includes the following topics:

- [Skill based reporting](#) on page 14
- [Recommendations for custom reports](#) on page 14
- [Resources for system performance analysis](#) on page 15
- [Changing the dictionary](#) on page 15

Skill based reporting

The CMS server is optimized for skill based reporting. Avaya recommends that you create and use reports on skills instead of Agent Group reports. Skills that do not receive actual calls can be created on the Communication Manager. You can use these skills to provide reporting for the agents that are placed in that skill.

To use Agent Group reports, follow the recommendations provided in [Recommendations for custom reports](#) on page 14.

Recommendations for custom reports

When you design and use custom Agent Group reports, consider the following recommendations to optimize system performance:

- Agent Groups
 - The size of agent groups are recommended to be 99 agents or lesser. Agent groups of size 99 agents or less are recommended because system performance can be adversely affected.

Note:

The agent group capacity of 99 agents or lesser is only available on Dell R720, VMware large configuration, and Oracle T4.

- If possible, report on consecutive Agent IDs in the same report
- If possible, limit Agent Group reports and use skill based reports
- Number of agents or other elements in historical or real time reports

- Carefully examine the number of agents, skills, VDNs, trunks, or other elements in one report. Limit the number of agents or other elements in a single report as much as possible.
- Custom report design
 - In historical reports, there should be no input for multiple dates when running against the interval database tables. Existing reports that allow multiple dates should be modified to gain access to the appropriate daily/weekly/monthly table instead of the interval table.
 - Any historical report that takes longer than a few seconds to complete should be reviewed for modification to improve performance.
 - Any real-time report that takes more than a few milliseconds to refresh should be reviewed or modified to improve performance.

Resources for system performance analysis

Customers can work with Avaya Professional Services to design and use custom reports in a manner that maximizes system performance. The Avaya Professional Services organization provides services that include a performance analysis of custom reports on a CMS system. Avaya Professional Services can also provide recommendations on how to efficiently design current or future reports in a manner that minimizes impact to CMS performance.

Changing the dictionary

Changes to the dictionary must occur during off hours when there are least database updates. Otherwise, CMS Supervisor users will need to constantly query the database to update the cache on the computer where CMS Supervisor is running. This causes the real-time reports to hang, and users are denied access to CMS Supervisor.

