
Design parameters

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Introduction

This section describes sets of design parameters that set an upper boundary on certain system capacities. Changes to these parameters generally require a revision to the software and are constrained by other basic capacities such as memory and traffic or system load. The design parameters are set to provide the best possible balance between limits.

Note on terminology

Each Media Gateway in the CS 1000E can be connected to an optional Media Gateway Expander in order to increase the number of card slots available. In this chapter, all references to Media Gateways include the optional Media Gateway Expander, if equipped.

System parameters

Table 19 "System parameters" (page 178) lists system parameters and provides their maximum values.

Table 19
System parameters

System parameters	Maximum value	Comments
Customers	100	
Display messages for background terminal	255	
Input/output ports (for example, TTYs and printers)	16	Two physical (Com 1 and Com 2) and fourteen PTYs to Terminal Server (history file counts as one device)
AML/CSL links	16	IP links
TNs – CS 1000E	32 676	Software design limit. Actual number of TNs will be constrained by physical capacity, real time, memory, and License limits.

Customer parameters

Table 20 "Customer parameters" (page 178) lists customer parameters and their maximum values.

Table 20
Customer parameters

Customer parameters	Maximum value	Comments
Tenants	512	
Dial Intercom Groups	2046	
Members per Dial Intercom Group	100	
Ringing Number Pickup groups	4095	Call Pickup Group 0 = no pickup group
Listed Directory Numbers (direct inward dialing only)	6	
DISA DNs	240	

Console and telephone parameters

Table 21 "Console and telephone related parameters" (page 179) lists console and telephone-related parameters and their maximum values.

Table 21
Console and telephone related parameters

Console/telephone parameters	Maximum value	Comments
Consoles per customer	63	
Lamp field arrays per customer	1	May be repeated once on another console.
Lamps per array (all numbers must be consecutive)	150	
Feature keys per attendant console: – M2250	20	
Incoming call indicators per console	20	
Trunk group busy indicators per console: – M2250	20	
Additional key/lamp strips: – console – telephones	2 6	
Add on modules: – M3904 Key Expansion Module (KEM) – IP Phone 2002 KEM – IP Phone 2004 KEM	2 1 one-page KEM 2 one-page KEM or 1 two-page KEM	
Protect bcs block length	512	

Trunk and route parameters

Table 22 "Trunk and network-related parameters" (page 179) lists trunk and network-related parameters and their maximum values.

Table 22
Trunk and network-related parameters

Trunk/network parameters	Maximum value	Comments
Trunk routes per customer	512	
Members per trunk route	510	
RAN trunks per RAN route	10	
Trunk access restriction groups	32	

Trunk/network parameters	Maximum value	Comments
Locations in an ESN network	1000 or 16 000	1000 without ESN Location Code Expansion (LOCX) package 400; 16 000 with the LOCX package 400
Basic authorization codes	4096	
Length of basic authcode	14 digits	
Network authorization codes	20 000	ESN networks
Length of network authcode	7 digits	Fixed length defined per customer
NCOS: – CDP – BARS/NFCR – NARS/NSIG/AUTOVON	3 7 15	
Route lists: – CDP – BARS – NARS	32 128 256	
Route list entries	64	
NFCR trees	255	New Flexible Code Restriction
IDC trees	255	Incoming DID Digit Conversion
Virtual Trunk D-channels	64	

ACD feature parameters

Table 23 "ACD feature parameters" (page 180) lists ACD feature parameters and their maximum values.

Table 23
ACD feature parameters

ACD parameters	Maximum value	Comments
ACD DN's and CDNs per customer	-1000 (CP PII, CP PIV, CP PM)	The ACD-E package required, otherwise the limit is 240.
Agent positions per DN	-1200	Real-time and physical capacity constraints can limit this further.
Agent priorities	48	
Agent IDs per customer	9999	
Agents logged in at one time per system	9999	Real-time constraints can limit this further.
AST DN's per telephone	2	

ACD parameters	Maximum value	Comments
Number of ACD-ADS customers	5	
Links per VASID	1	

Special feature parameters

Table 24 "Non-ACD feature parameters" (page 181) lists non-ACD feature parameters and their maximum values.

Table 24
Non-ACD feature parameters

Feature parameters	Maximum value	Comments
Speed call lists per system	8191	The number of speed call lists and the number of DNs per speed call list can be limited by the amount of available memory on the system (protected and unprotected data store).
Number of DNs in speed call list	1000	
Multiple appearances of the same directory number (MADN)	30*	Limited by watchdog timer. *See Steps in a hunting group.
Steps in a hunting group	30*	Marketing objective, limited by watchdog timer. *In combination with MADN, each hunt step with more than 16 appearances is counted as two, so the maximum combination of MADN and hunt steps is 30 MADN and 15 hunt steps.
Number of Call Party Name Display names defined	Variable	Limited by the number of DNs defined and available space in the protected data store.
CPND length: – SL-1 protocol – ISDN protocol	27 24	Software design limit. Display IE limitation (DMS switches have a display IE limit of 15).

Feature parameters	Maximum value	Comments
AWU calls in 5 minutes	500	Marketing objective, constrained by ring generator.
Group Call Feature: –Groups per customer –Stations per group	64 10	
BRI application: –Protocol parameter telephone groups per system –Terminal service profiles (per DSL) DSLs –LTIDs	16 32 000 640 000	Software design limit; actual number is constrained by the number of TNS in the system. Each DSL occupies 2 TNS. Software design limit; each DSL can have a maximum of 20 LTIDs. The maximum number of LTIDs is limited by the number of DSLs, by memory, and by real time.

Hardware and capacity parameters

The software design limits are not typically the binding constraints. The number of items of a particular type is usually determined by a combination of loop and slot constraints (if the item requires loops) or by slot constraints alone.

Table 25 "Physical capacity/hardware-related parameters" (page 182) lists hardware and capacity parameters and their maximum values.

Table 25
Physical capacity/hardware-related parameters

Physical capacity/hardware parameters	Maximum value (loops)	Comments
MGCONF	MGC - 2 SSC - 4	Provide Conf, and MFS functionality for the cards in that MG 1000E

Physical capacity/hardware parameters	Maximum value (loops)	Comments
MGTDs	MGC - 2 SSC - 2	Provide TDS functionality for the cards in that MG 1000E.
Total service and terminal loops	256	Each superloop requires 4 loops.

Voice Gateway Media Cards

A Voice Gateway Media Card is any Media Card running the IP Line application.

In the CS 1000E, Voice Gateway Media Cards are used primarily for DSP connections between the TDM devices in an MG 1000E and IP circuits.

Voice Gateway Media Cards can be assigned to any slot other than slot 0. Each MG 1000E must be provisioned with enough Voice Gateway Media Cards to support the TDM devices in that MG 1000E.

Memory-related parameters

Table 26 "Memory-related parameters" (page 183) lists memory-related parameters and their maximum values.

Table 26
Memory-related parameters

Parameter	Values
	CS 1000E
Low-priority input buffers	95 – 5000
• (recommended default)	(3500)
High-priority input buffers	16 – 5000
• (recommended default)	(3500)
<p>In a system with CallPilot, AML, and Symposium, add the number of CSQI and CSQO to the Call Register (CR) requirement obtained from feature impact calculations.</p> <p>The buffer estimates were based on relatively conservative scenarios, which should cover most practical applications in the field. However, most models deal with "average traffic". When traffic spikes occur, buffers can overflow. In these cases, raise the buffer size, depending on the availability of CRs. The maximum number of buffers allowed for CSQI and CSQO is 25% of NCR or 4095, whichever is less.</p>	

Parameter	Values
	CS 1000E
Input buffer size (words)	4
500-telephone, trunk and digital telephone output buffer	16 – 2048 (2000)
• (recommended default)	
Message length (words)	4
D-channel input buffer size (bytes)	261
D-channel output buffer size (bytes)	266
TTY input buffer size (characters)	512
TTY output buffer size (characters)	2048
Number of call registers	26 – 50 000 (25 000)
• (recommended)	30 000 minimum call registers for systems with 22500 IP Phones.
Call registers assigned to AUX	26–255
Number of AML msg call registers	25 – the minimum of 25% of total call registers or 255 (default 25)
Call registers for CSL input queues (CSQI)	Maximum 25% of total call registers or 4095 (default 20)
<p>In a system with CallPilot, AML, and Symposium, add the number of CSQI and CSQO to the Call Register (CR) requirement obtained from feature impact calculations.</p> <p>The buffer estimates were based on relatively conservative scenarios, which should cover most practical applications in the field. However, most models deal with "average traffic". When traffic spikes occur, buffers can overflow. In these cases, raise the buffer size, depending on the availability of CRs. The maximum number of buffers allowed for CSQI and CSQO is 25% of NCR or 4095, whichever is less.</p>	

Parameter	Values
	CS 1000E
Call registers for CSL/AML output queues (CSQO)	Maximum 25% of total call registers or 4095 (default 20)
Auxiliary input queue	20 – the minimum of 25% of total call registers or 255 (default 20)
Auxiliary output queue	20 – the minimum of 25% of total call registers or 255 (default 20)
History file buffer length (characters)	0 – 65 535
<p>In a system with CallPilot, AML, and Symposium, add the number of CSQI and CSQO to the Call Register (CR) requirement obtained from feature impact calculations.</p> <p>The buffer estimates were based on relatively conservative scenarios, which should cover most practical applications in the field. However, most models deal with "average traffic". When traffic spikes occur, buffers can overflow. In these cases, raise the buffer size, depending on the availability of CRs. The maximum number of buffers allowed for CSQI and CSQO is 25% of NCR or 4095, whichever is less.</p>	

Buffer limits

The buffer limit is the maximum number of Call Registers (CR) that can be used for that particular function out of the total CR pool. If the designated limit is larger than needed and there are still spare CRs, the unused CRs will not be tied up by this specific function. Therefore, there is little penalty for overstating the buffer size limit, as long as the limit is within the number of CRs available to the system.

The values provided in [Table 26 "Memory-related parameters" \(page 183\)](#) indicate the relative requirements for various buffers. They are the minimum buffer size needed to cover most applications under the constraint of tight memory availability. When increasing buffer sizes, make the increases proportional to the values in [Table 26 "Memory-related parameters" \(page 183\)](#). This guideline applies in all cases except CSQI/CSQO, which is relatively independent of other buffers and can be increased without affecting others.

For example, with a CS 1000E Call Center (maximum 25 000 CRs) using many applications (such as CallPilot), it would be advisable to set the CSQI/CSQO to a high value (even up to the limit of 4095).