

# Les bases du dépannage

Recherche des goulots d'étranglement

Christophe LAPORTE – SQL Server MVP/MCM  
SQL Saturday 758 – Montréal 2018



# Christophe LAPORTE

 Microsoft®  
SQL Server® ~ since 1997 : SQL 6.5 / WinNT4

 christophe\_laporte@hotmail.fr

 <http://conseilit.wordpress.com/>

 @conseilit



- Audit
- Conseil
  - Infrastructure / Architecture
  - Virtualisation / Cloud
  - Haute disponibilité
  - Performance / Optimisation
  - Dépannage / Migrations
- Formations
- Remote DBA

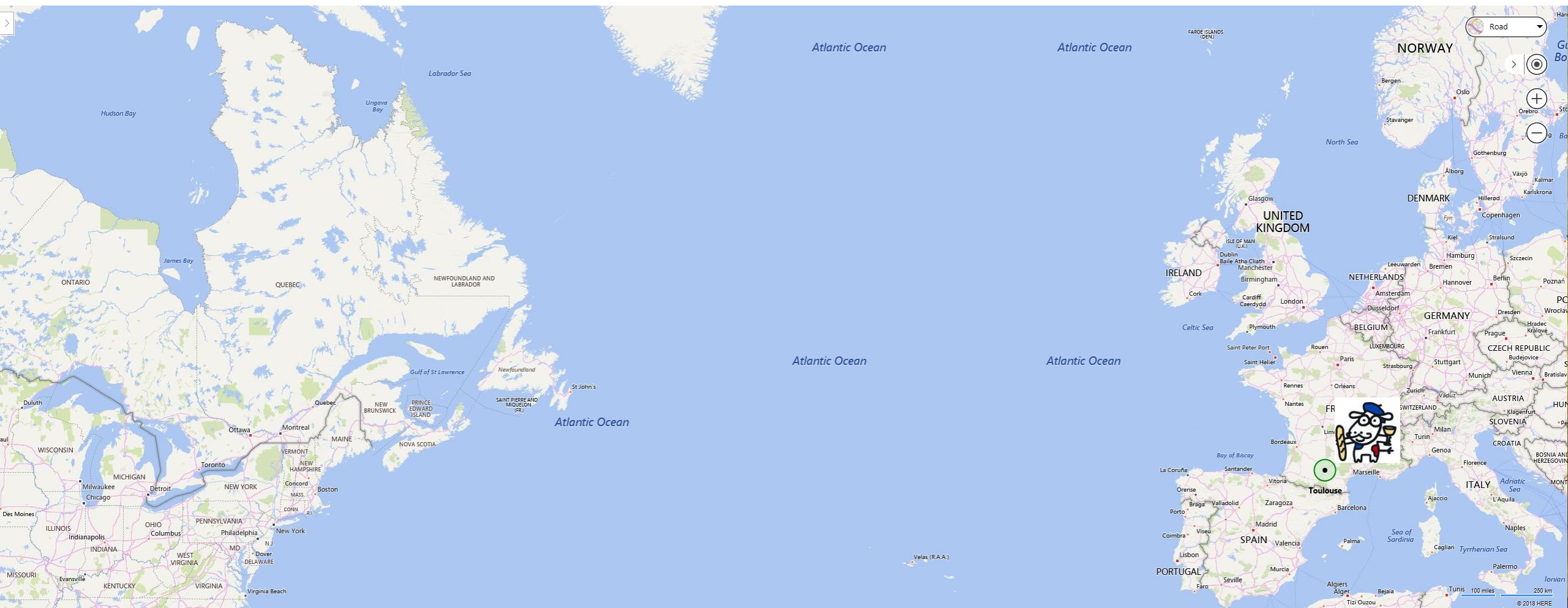


# Toulouse – France



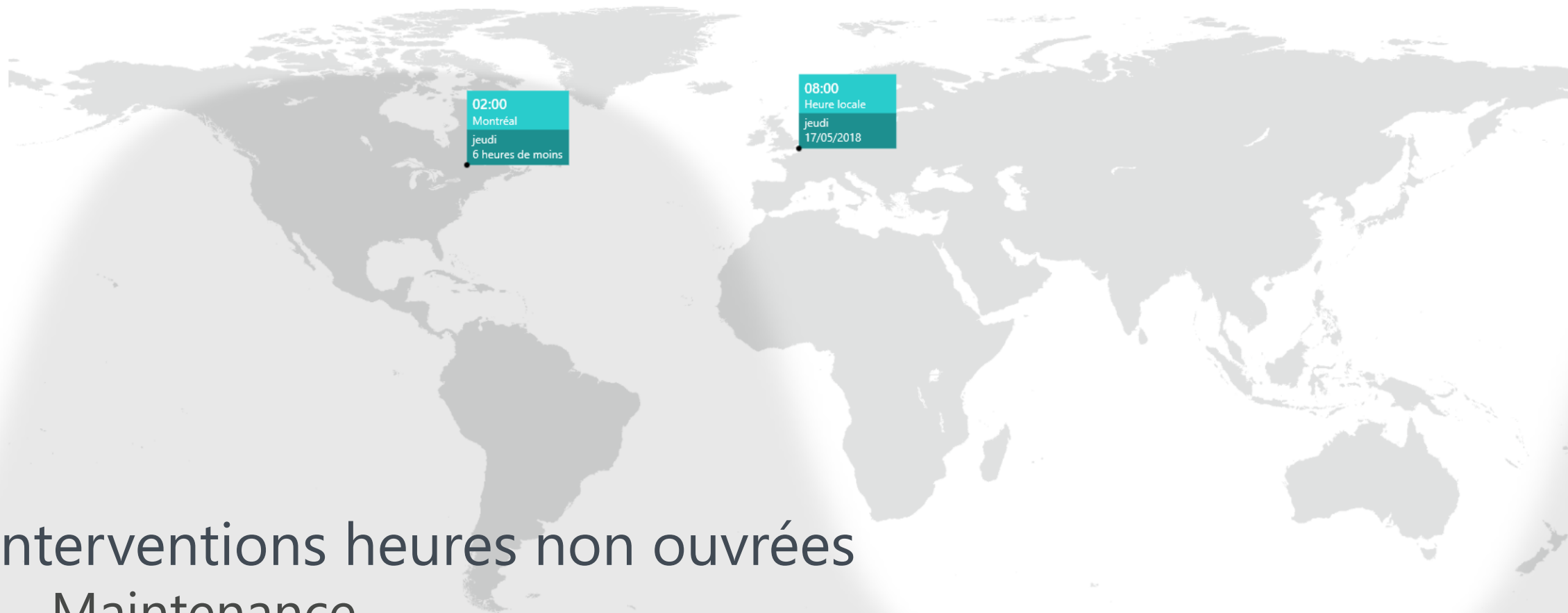


# Pourquoi ?



# Montréal:UTC-5

# Paris:UTC+1







## Interventions heures non ouvrées

Maintenance

Migration

Dépannage

# Thanks to our sponsors

Global	Gold		Silver	Bronze
Microsoft	JetBrains	Rubrik	Delphix	Solution OMD
 Microsoft		 rubrik	D E L P H I X	 SOLUTION OMD

And  PASS



# Agenda

DMVs & DMFs

Wait and Queues

Compteurs de performance

Outils



# DMVs et DMFs

SQL Server expose énormément d'informations

Ne pas confondre avec le Catalog View

Les noms d'objet commencent par sys.dm\_\*

name	type_desc
sys.dm_resource_governor_resource_pool_volumes	VIEW
sys.dm_os_hosts	VIEW
sys.dm_os_memory_brokers	VIEW
sys.dm_db_stats_properties_intenal	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_exec_cached_plan_dependent_objects	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_os_memory_allocations	VIEW
sys.dm_db_xtp_nonclustered_index_stats	VIEW
sys.dm_db_mirroring_past_actions	VIEW
sys.dm_xe_session_object_columns	VIEW
sys.dm_os_loaded_modules	VIEW
sys.dm_db_task_space_usage	VIEW
sys.dm_os_memory_objects	VIEW
sys.dm_audit_class_type_map	VIEW
sys.dm_logpoolmgr_stats	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_os_schedulers	VIEW
sys.dm_os_server_diagnostics_log_configurations	VIEW
sys.dm_hadr_instance_node_map	VIEW
sys.dm_io_cluster_valid_path_names	VIEW
sys.dm_os_dispatcher_pools	VIEW
sys.dm_xtp_transaction_stats	VIEW
sys.dm_exec_query_profiles	VIEW
sys.dm_os_threads	VIEW
sys.dm_db_objects_disabled_on_compatibility_level_change	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_exec_requests	VIEW
sys.dm_fts_parser	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_tran_commit_table	VIEW
sys.dm_exec_query_parallel_workers	VIEW
sys.dm_cryptographic_provider_keys	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_fts_outstanding_batches	VIEW
sys.dm_db_missing_index_columns	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_exec_query_optimizer_memory_gateways	VIEW
sys.dm_repl_tranhash	VIEW
sys.dm_hadr_cluster	VIEW
sys.dm_qn_subscriptions	VIEW
sys.dm_db_session_space_usage	VIEW
sys.dm_xtp_gc_stats	VIEW
sys.dm_exec_query_optimizer_info	VIEW
sys.dm_xe_map_values	VIEW
sys.dm_db_log_stats	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_db_xtp_index_stats	VIEW
sys.dm_tran_top_version_generators	VIEW
sys.dm_fts_fdhosts	VIEW
sys.dm_os_file_exists	SQL_INLINE_TABLE_VALUED_FUNCTION
sys.dm_xe_sessions	VIEW
sys.dm_db_log_space_usage	VIEW
sys.dm_hadr_name_id_map	VIEW

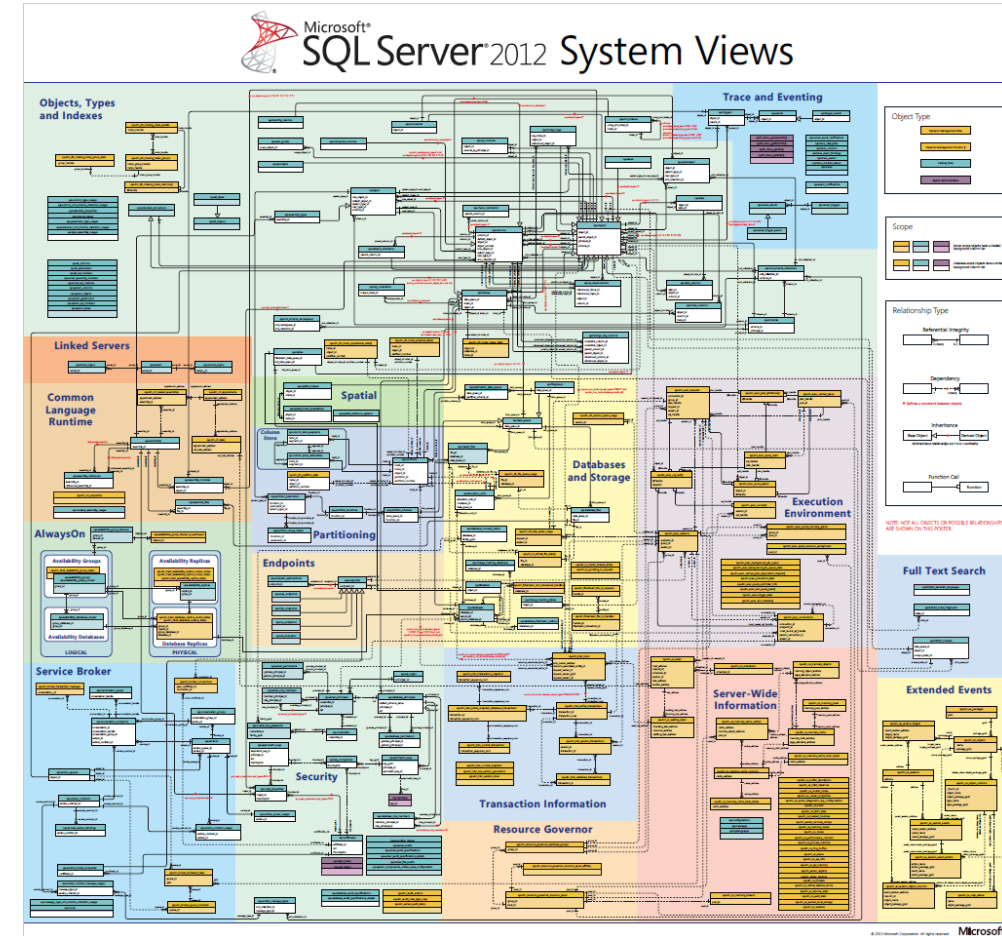
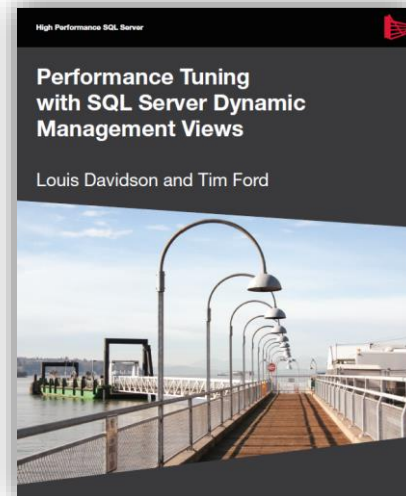
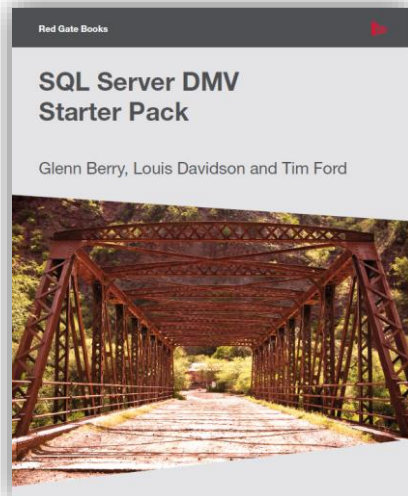


# DMVs et DMFs

Orienté DBA

Près de 250 vues et fonctions !

Par où commencer ?



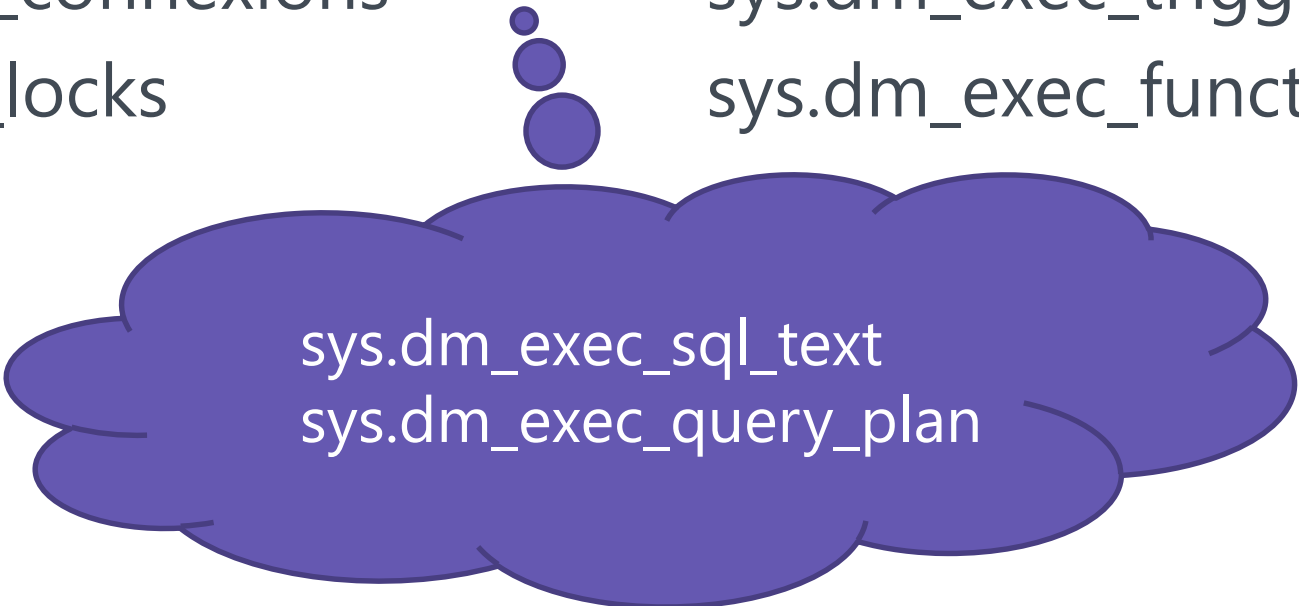
# Les basiques...

## Temps réel

sys.dm\_exec\_requests  
sys.dm\_exec\_sessions  
sys.dm\_exec\_connexions  
sys.dm\_tran\_locks

## Historique

sys.dm\_exec\_query\_stats  
sys.dm\_exec\_procedure\_stats  
sys.dm\_exec\_trigger\_stats  
sys.dm\_exec\_function\_stats



sys.dm\_exec\_sql\_text  
sys.dm\_exec\_query\_plan



# Sys.dm\_os\_schedulers

## Construction de VM vs édition SQL Server !

The screenshot displays the SQL Server Enterprise Manager interface. At the top, a query window shows the command `select * from sys.dm_os_schedulers`. Below it, the results grid lists 20 schedulers with columns for scheduler\_address, parent\_node\_id, scheduler\_id, cpu\_id, status, is\_online, is\_idle, preemptive\_switches\_count, context\_switches\_count, idle\_switches\_count, current\_tasks\_count, runnable\_tasks\_count, current\_workers\_count, and active\_workers\_count. The status of schedulers varies between 'VISIBLE ONLINE', 'VISIBLE OFFLINE', and 'HIDDEN ONLINE'.

On the left, the 'Gestionnaire des tâches' (Task Manager) window is open, showing the 'Processeur' (Processor) tab. It displays the CPU usage of the host (Intel(R) Xeon(R) CPU E5-2660 v...) and provides a detailed view of the processor's performance, including utilization, speed, and other metrics.

On the right, the 'Propriétés du serveur' (Server Properties) dialog box is open, showing the 'Général' (General) tab. It displays the server's name, product, system, platform, version, language, memory, and other configuration details.

id	scheduler_address	parent_node_id	scheduler_id	cpu_id	status	is_online	is_idle	preemptive_switches_count	context_switches_count	idle_switches_count	current_tasks_count	runnable_tasks_count	current_workers_count	active_workers_count
1	0x00000003FF190040	0	0	0	VISIBLE ONLINE	1	0	20702270	691349150	-2092496937	7	2	10	7
2	0x00000003FF1A0040	0	1	1	VISIBLE ONLINE	1	1	5477957	428410291	1421157490	10	0	13	8
3	0x00000003FF1B0040	0	2	2	VISIBLE ONLINE	1	0	20671401	782641825	-1885117218	7	2	10	7
4	0x00000003FF1C0040	0	3	3	VISIBLE ONLINE	1	0	19632001	720758079					
5	0x00000003FF1D0040	0	4	4	VISIBLE OFFLINE	0	1	0	1					
6			5	5	VISIBLE OFFLINE	0	1	0	1					
7			6	6	VISIBLE OFFLINE	0	1	0	1					
8			7	7	VISIBLE OFFLINE	0	1	1	3					
9			0	0	HIDDEN ONLINE	1	0	259239440	0					
10			0	0	VISIBLE ONLINE (DAC)	1	1	4	9					
11			1	1	HIDDEN ONLINE	1	1	0	0					
12			2	2	HIDDEN ONLINE	1	1	0	0					
13			3	3	HIDDEN ONLINE	1	1	6	0					
14			4	4	HIDDEN ONLINE	1	1	2	0					
15			5	5	HIDDEN ONLINE	1	1	1315846	0					
16			6	6	HIDDEN ONLINE	1	1	52353	0					
17			7	7	HIDDEN ONLINE	1	1	37983	0					
18			0	0	HIDDEN ONLINE	1	1	37093	0					
19			1	1	HIDDEN ONLINE	1	1	35291	0					
20			2	2	HIDDEN ONLINE	1	1	17532	0					
21			3	3	HIDDEN ONLINE	1	1	27712	0					
22			4	4	HIDDEN ONLINE	1	1	24279	0					
23			5	5	HIDDEN ONLINE	1	1	26112	0					
24			6	6	HIDDEN ONLINE	1	1	34948	0					
25			7	7	HIDDEN ONLINE	1	1	26352	0					
26			0	0	HIDDEN ONLINE	1	1	22144	0					
27			1	1	HIDDEN ONLINE	1	1	27916	0					
28			2	2	HIDDEN ONLINE	1	1	32432	0					
29			3	3	HIDDEN ONLINE	1	1	28642	0					
30			4	4	HIDDEN ONLINE	1	1	47826	0					
31			5	5	HIDDEN ONLINE	1	1	33216	0					
32			6	6	HIDDEN ONLINE	1	1	48436	0					
33			7	7	HIDDEN ONLINE	1	1	47776	0					
34			0	0	HIDDEN ONLINE	1	1	12174	0					



# Un œil sur les index !

sys.dm\_db\_missing\_index\_\*

Ne pas prendre au pied de la lettre !

Mais de bonnes indications ...

sys.dm\_db\_index\_physical\_stats

Fragmentation, nombre de pages

Taille des enregistrements

sys.dm\_db\_index\_usage\_stats

Lectures vs écritures

Index non utilisés

sys.dm\_db\_index\_operational\_stats

Locks, latches

Forwarded fetch

object_id	index_id	user_scans	user_seeks	user_lookups	user_read	user_updates
1840373971	17	0	0	0	0	812,453,385
1840373971	18	0	0	0	0	62,707,474
1004894997	12	0	0	0	0	28,006,915
1840373971	110	0	0	0	0	21,069,789
1105035318	10	0	0	0	0	15,059,636
1105035318	7	0	0	0	0	15,059,636
1105035318	28	0	0	0	0	15,059,636
1105035318	8	0	0	0	0	14,653,046
1105035318	41	0	0	0	0	14,570,448
1105035318	42	0	0	0	0	14,570,402
1105035318	2	0	0	0	0	14,570,402

object_id	index_id	row_lock_count	row_lock_wait_count	row_lock_wait_in_ms
450412974	1	122,930,566	632,877	10,041,545
450412974	3	721,703	10,676	173,883
1013578649	1	14,495,641	216	103,346
32367530	1	16,108	728	84,668
812894313	3	28,610,039	220	18,689

object_id	index_id	row_lock_count	row_lock_wait_count	row_lock_wait_in_ms
904116199	1	153,460	12	175,063,393
1897213959	2	13,332,283	13	99,635,110
1513342193	3	9,533,727	2	33,459,970
1902407784	2	4,388,757,801	202	10,151,833
520857418	6	1,672	1	2,001,204
639809837	4	57,610,644	223	1,397,563

object_id	index_id	leaf_insert_count	leaf_delete_count	leaf_update_count	leaf_ghost_count	forwarded_fetch_count
645577338	0	226 174	231 897	4 091 359	0	405 325
677577452	0	1 771	0	0	0	54 963

# Statistiques d'index

sys.stats

sys.dm\_db\_stats\_properties

sys.dm\_db\_stats\_histogram

Date de dernière mise à jour

Détail de l'histogramme

Nombre de lignes

Nombre de lignes modifiés

object_id	stats_id	last_updated	rows	rows_sampled	steps	unfiltered_rows	modification_counter
2018158285	1	2018-05-17 05:35:04.3300000	1091002	141418	137	1091002	299
2018158285	2	2018-05-17 05:35:05.4066667	1091002	1091002	185	1091002	299
2018158285	3	2018-05-17 05:35:06.3500000	1091002	123696	201	1091002	299
2018158285	4	2018-05-17 05:35:06.2500000	1091002	123696	193	1091002	299
2018158285	5	2018-05-17 05:35:05.7666667	1091002	123696	170	1091002	299
2018158285	6	2018-05-17 05:35:05.6733333	1091002	123696	117	1091002	299
2020918271	1	2018-05-17 05:33:01.0966667	418631	88294	176	418631	70
2020918271	2	2018-05-17 05:33:02.1600000	418631	99502	188	418631	184
2020918271	3	2018-05-17 05:33:01.1600000	418631	89443	193	418631	186
2020918271	4	2018-05-17 05:33:02.3100000	418631	89443	2	418631	184
2020918271	5	2018-05-17 05:33:02.2433333	418631	99502	97	418631	184
2020918271	6	2018-05-17 05:33:02.4300000	418631	89443	175	418631	184
2020918271	7	2018-05-17 05:33:02.3700000	418631	89443	191	418631	184
2020918271	8	2018-05-17 05:33:02.6300000	418631	89443	2	418631	184
2020918271	9	2018-05-17 05:33:02.5766667	418631	89443	196	418631	184
2020918271	10	2018-05-17 05:33:01.2500000	418631	89443	2	418631	184
2020918271	11	2018-05-17 05:33:02.6733333	418631	89443	1	418631	184
2020918271	12	2018-05-17 05:33:02.7300000	418631	89443	3	418631	184

object_id	stats_id	step_number	range_high_key	range_rows	equal_rows	distinct_range_rows	average_range_rows
53575229	1	1	1	0	1	0	1
53575229	1	2	4282	4280	1	4280	1
53575229	1	3	7816	3533	1	3533	1
53575229	2	1	A. Datum Corporation	0	470	0	1
53575229	2	2	Fabrikam, Inc.	0	7346	0	1
53575229	3	1	15" LCD screen; 4 USB ports (USB 1.0)	0	1945	0	1
53575229	3	2	15" LCD screen;1 cash drawer port;5 USB ports (USB 2.0)	0	359	0	1
53575229	3	3	15" LCD screen;Cash Drawer, Barcode Scanner, Receipt...	0	383	0	1
53575229	3	4	15" LCD screen;Cash Drawer, Barcode Scanner,Receipt ...	0	213	0	1
53575229	3	5	4GB DDR2 Memory; 250GB Hard Drives	0	3040	0	1
53575229	3	6	4-port (Wireless Cable/DSL access point)	0	10	0	1
53575229	3	7	7-Port (each port can be used as either an RJ-45 10/100 ...	0	460	0	1
53575229	3	8	Contoso 2.00GHz Core Processors; 4GB Memory; 250GB...	0	346	0	1
53575229	3	9	Dual 2.33GHz Core Processor; 8GB DDR2 667MHz PC5...	0	1060	0	1
53575229	4	1	Linux2.6	0	2304	0	1
53575229	4	2	Router OS; NAT and SPI firewall	0	10	0	1
53575229	4	3	UNKNOWN	0	460	0	1
53575229	4	4	Windows Embedded for Point of Service	0	383	0	1
53575229	4	5	Windows Embedded POSReady 2009	0	213	0	1
53575229	4	6	Windows Server 2003	0	3386	0	1
53575229	4	7	Windows Server 2008	0	1060	0	1
53575229	5	1	Catalog Data Center	0	575	0	1
53575229	5	2	Online Data Center	0	4341	0	1





# DMVs et DMFs

Enormément d'informations renvoyées  
interprétation des chiffres !

Vision historique

historiser les données ?

Vision temps reel

sp\_whoisactive (@AdamMachanic)

Scripts Glenn Berry (@GlennAlanBerry)

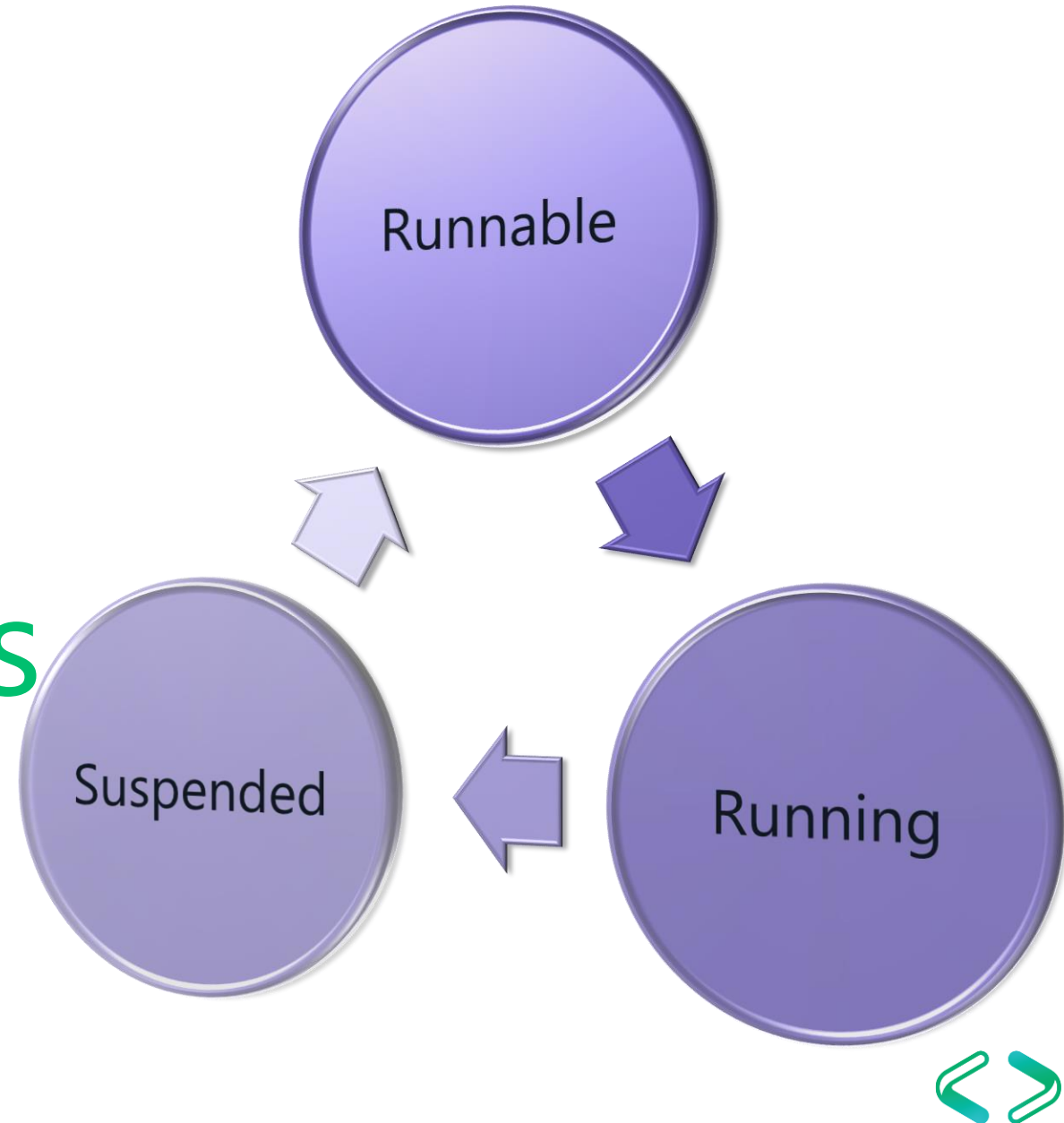
<https://www.sqlskills.com/blogs/glenn/category/dmv-queries/>



# Wait and Queues

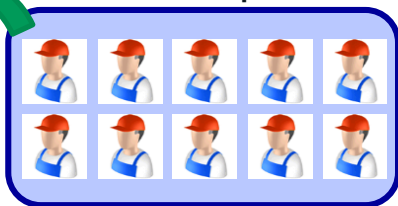
Technique pragmatique

Détection de goulots d'étranglement



Request...

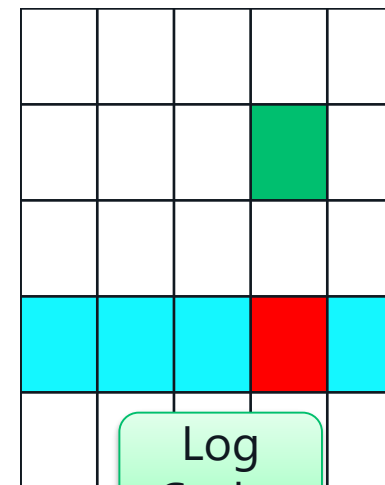
Worker pool



Free List

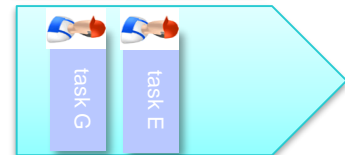
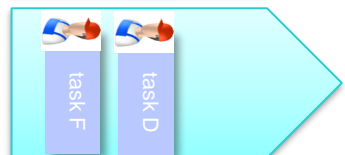
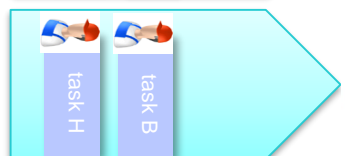
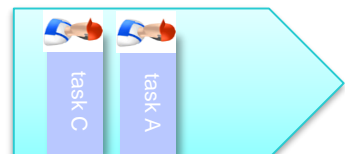


Buffer pool



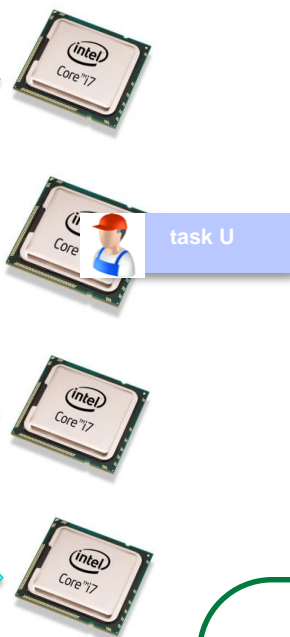
Log  
Cache

sys.dm\_os\_waiting\_tasks  
sys.dm\_os\_wait\_stats  
sys.dm\_exec\_session\_wait\_stats



Runnable Queue  
(signal\_wait\_time)

Running



Network

Locks

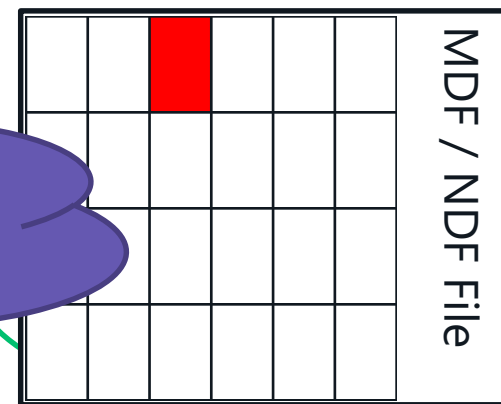
Latches

IOs

DBCC SQLPERF ('sys.dm\_os\_wait\_stats', CLEAR);

Insert  
Update  
Delete  
Merge  
Truncate

LDLF File

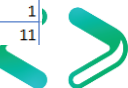


# Attentes les plus fréquentes

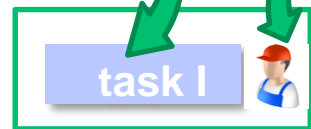
WaitType	Wait_Sec	Resource_Sec	Signal_Sec	Wait Count	Wait Percentage
WRITELOG	10780538.49	10429545.21	350993.29	645164078	75.36
PREEMPTIVE_XE_DISPATCHER	1759175.48	1759175.48	0.00	3	12.30
SOS_SCHEDULER_YIELD	400567.84	301.54	400266.30	236500272	2.80
LCK_M_S	296141.00	295495.85	645.15	710421	2.07
ASYNC_NETWORK_IO	248598.86	248457.49	141.37	215088	1.74
CXPACKET	215274.82	197232.30	18042.52	12754864	1.50
PAGELATCH_EX	91874.66	8171.45	83703.21	244349126	0.64
PAGEIOLATCH_SH	70499.86	70160.77	339.09	2218419	0.49
PAGEIOLATCH_EX	59815.51	59679.20	136.31	452519	0.42
PAGELATCH_SH	56729.54	55900.11	829.43	4624950	0.40

WaitType	Wait_Sec	Resource_Sec	Signal_Sec	Wait Count	Wait Percentage
OLEDDB	42284.37	42284.37	0.00	2243385801	32.16
ASYNC_IO_COMPLETION	14996.42	14996.02	0.41	1730	11.41
BACKUPBUFFER	14563.56	14010.49	553.07	11753930	11.08
BACKUPIO	13811.04	13768.30	42.74	4242444	10.50
PAGEIOLATCH_SH	11954.69	11864.22	90.46	19529888	9.09
ASYNC_NETWORK_IO	8717.07	7564.87	1152.20	26038151	6.63
WRITELOG	7599.80	7306.75	293.04	7155355	5.78
PAGEIOLATCH_EX	3380.40	3343.49	36.91	6031488	2.57
SOS_SCHEDULER_YIELD	2983.83	53.80	2930.03	42931635	2.27
IO_COMPLETION	2434.85	2378.08	56.77	9309193	1.85
LCK_M_S	1405.47	1405.10	0.38	4145	1.07
CXPACKET	1267.15	1061.68	205.47	776636	0.96

session_id	wait_type	waiting_tasks_count	wait_time_ms	max_wait_time_ms	signal_wait_time_ms
304	TRACEWRITE	3192	74838	1206	270
60	WRITELOG	43005	29223	393	19987
67	LCK_M_S	37	13283	4103	3
228	SOS_SCHEDULER_YIELD	569	1096	9	1095
236	SOS_SCHEDULER_YIELD	139	871	17	871
356	SOS_SCHEDULER_YIELD	146	528	9	528
444	ASYNC_NETWORK_IO	13	376	135	8
175	SOS_SCHEDULER_YIELD	175	368	13	368
60	MEMORY_ALLOCATION_EXT	281356	348	0	0
239	BACKUPTHREAD	20	326	297	1
430	SOS_SCHEDULER_YIELD	169	277	15	277
189	MSQL_XP	99	190	48	0
427	SOS_SCHEDULER_YIELD	164	183	8	183
228	CXPACKET	92	182	6	31
225	SOS_SCHEDULER_YIELD	185	170	4	170
228	ASYNC_NETWORK_IO	14	166	68	5
172	SOS_SCHEDULER_YIELD	177	161	11	161
228	PAGELATCH_EX	140	134	4	133
356	PAGEIOLATCH_SH	58	134	8	0
222	CXPACKET	8	115	57	0
87	SLEEP_TASK	12	115	15	0
228	SLEEP_TASK	48	96	8	96
344	SOS_SCHEDULER_YIELD	26	72	8	72
228	PAGEIOLATCH_SH	67	67	16	0
207	SOS_SCHEDULER_YIELD	190	67	1	67
218	SOS_SCHEDULER_YIELD	169	66	5	66
239	PREEMPTIVE_OS_CREATEFILE	11	65	11	0
222	ASYNC_NETWORK_IO	2	62	62	0
85	SOS_SCHEDULER_YIELD	198	62	4	62
380	PAGEIOLATCH_SH	21	58	8	0
130	SOS_SCHEDULER_YIELD	14	55	7	55
380	SOS_SCHEDULER_YIELD	120	49	4	49
246	SOS_SCHEDULER_YIELD	17	41	4	41
239	SOS_SCHEDULER_YIELD	191	41	4	40
238	SOS_SCHEDULER_YIELD	64	37	4	37
60	SOS_SCHEDULER_YIELD	57	33	4	33
228	PAGELATCH_SH	42	32	4	32
236	IO_COMPLETION	11	28	4	12
67	PAGEIOLATCH_SH	39	26	4	1
67	WRITELOG	56	25	4	11



Request...



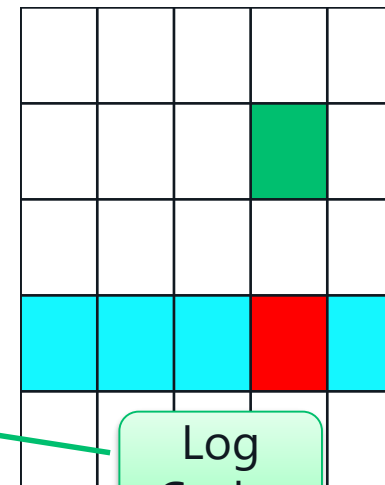
Worker pool



Free List

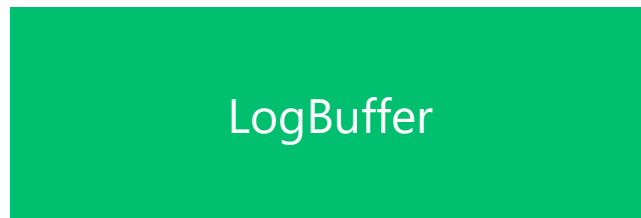


Buffer pool



Log Cache

LogBuffer



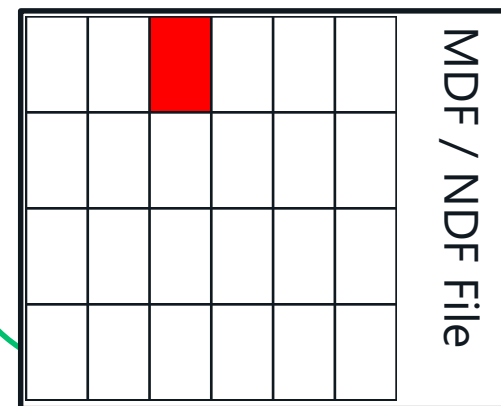
WriteLog



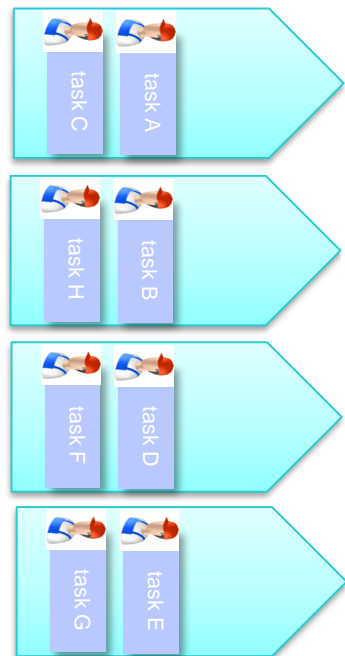
Insert  
Update  
Delete  
Merge  
Truncate

LDF File

MDF / NDF File



Runnable Queue  
(signal\_wait\_time)



Running



Network

Locks

Latches

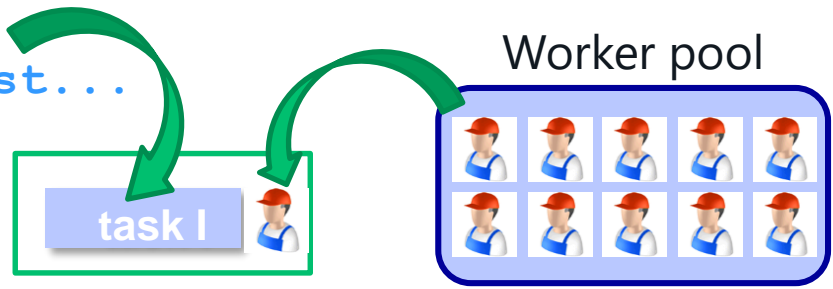
IOs



Waits / Resource Queues  
(resource\_wait\_time)



Request...

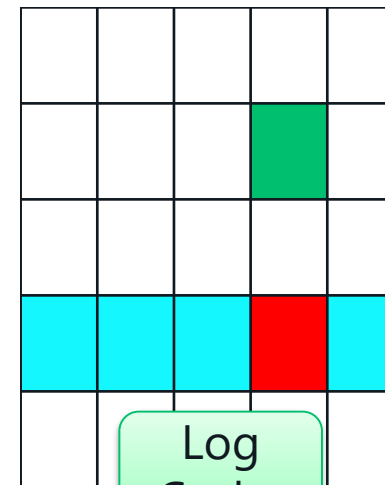


Worker pool

Free List



Buffer pool



Log  
Cache

ASYNC\_IO\_COMPLETION

Checkpoint

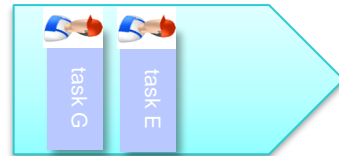
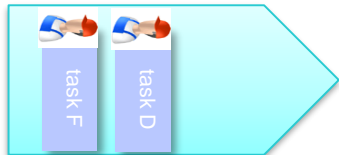
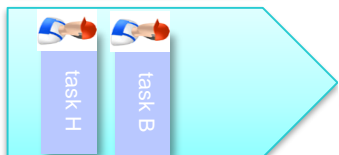
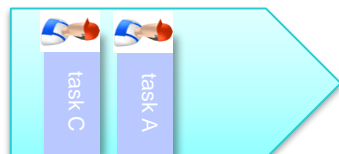
File creation

IO\_COMPLETION (Synchronous)

Read Log (recovery)

Read allocation bitmaps (recovery, restore)

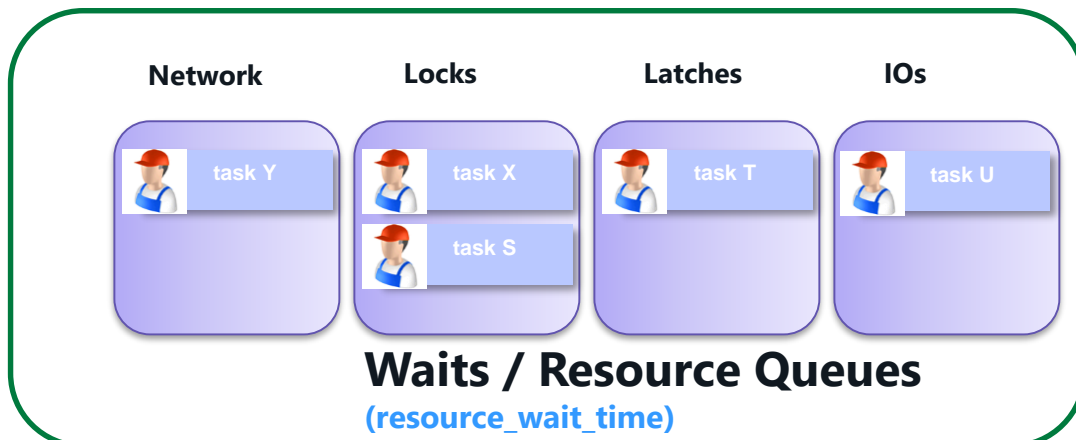
Write TempDB (Merge join, eager spool)



Runnable Queue  
(signal\_wait\_time)

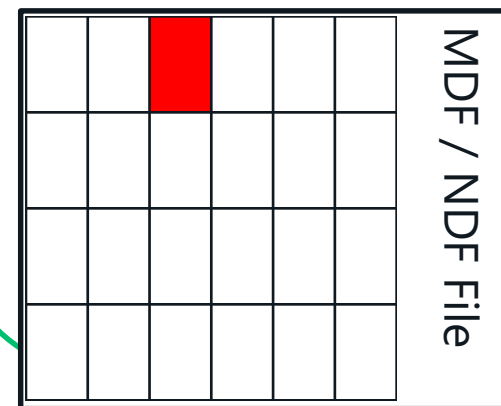


Running



Insert  
Update  
Delete  
Merge  
Truncate

LDF File



MDF / NDF File

Request...

task I

Worker pool

Free List

Buffer pool

PageIOLatch\_SH  
PageIOLatch\_EX

Log  
Cache

Insert  
Update  
Delete  
Merge  
Truncate

LDF File

Network

Locks

Latches

IOs

task Y

task X

task T

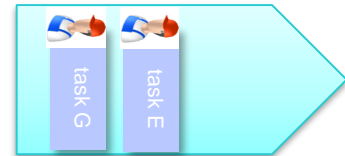
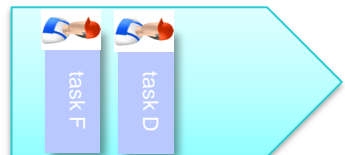
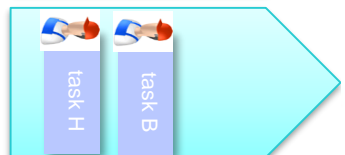
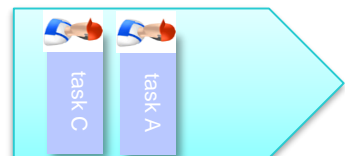
task U

task S

Waits / Resource Queues

(resource\_wait\_time)

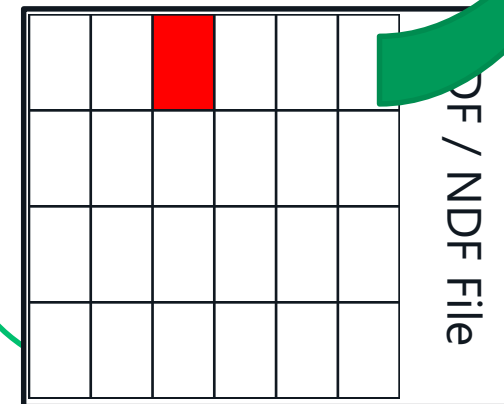
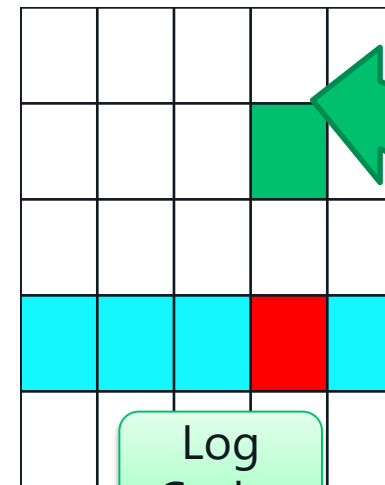
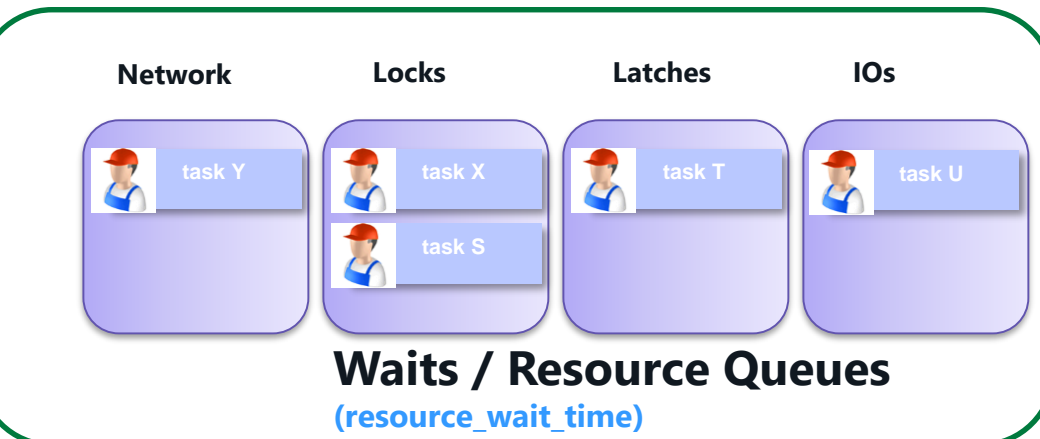
LDF / NDF File



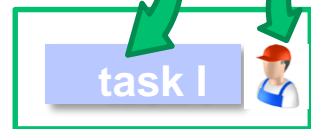
Runnable Queue  
(signal\_wait\_time)



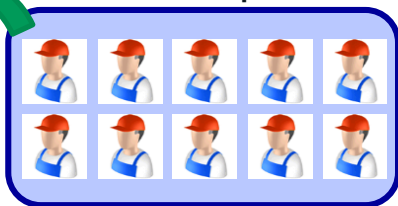
Running



Request...



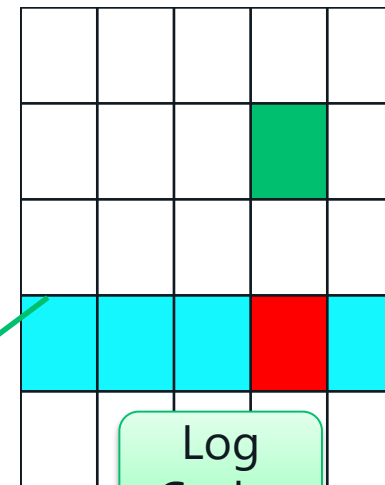
Worker pool



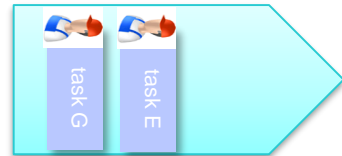
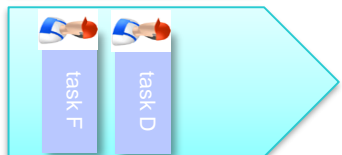
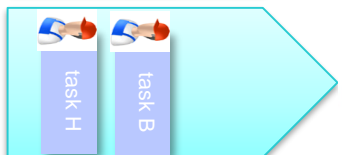
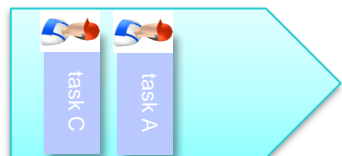
Free List



Buffer pool



Log  
Cache



Runnable Queue  
(signal\_wait\_time)



Running

PageLatch\_SH  
PageLatch\_EX  
Resource\_Semaphore

Network

Locks

Latches

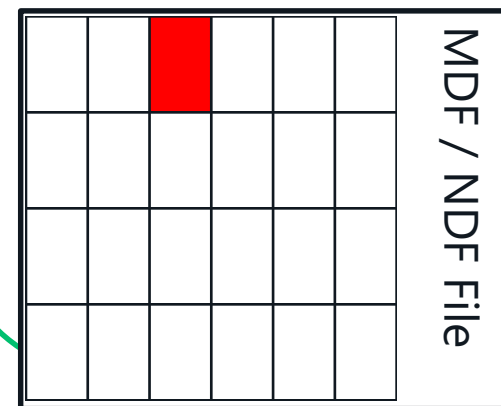
IOs



Waits / Resource Queues  
(resource\_wait\_time)

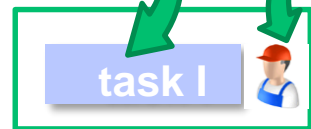
Insert  
Update  
Delete  
Merge  
Truncate

LDLF File



MDF / NDF File

Request...



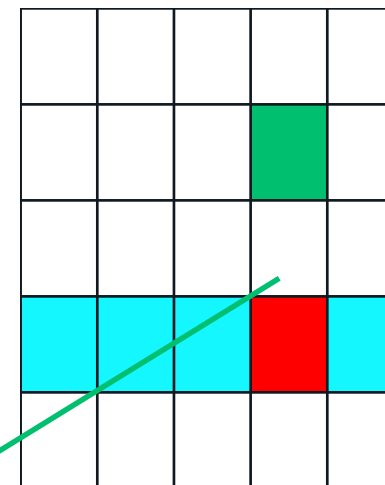
Worker pool



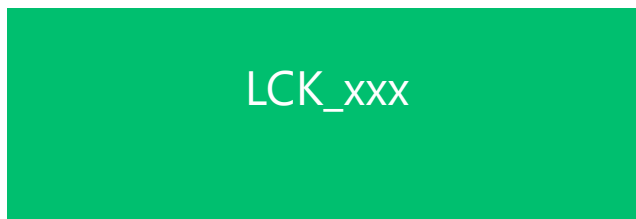
Free List



Buffer pool



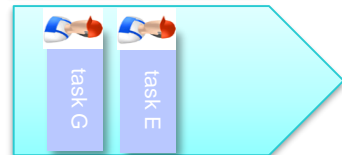
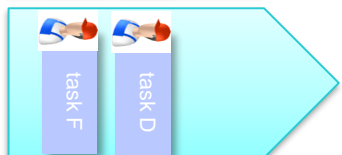
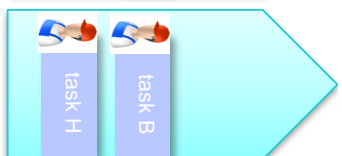
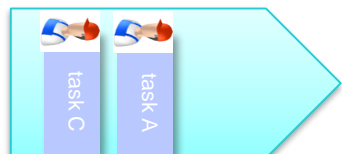
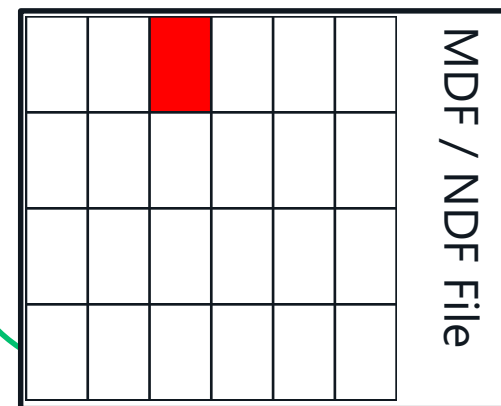
LCK\_xxx



Insert  
Update  
Delete  
Merge  
Truncate

LDF File

MDF / NDF File



Runnable Queue  
(signal\_wait\_time)

Running

Network

Locks

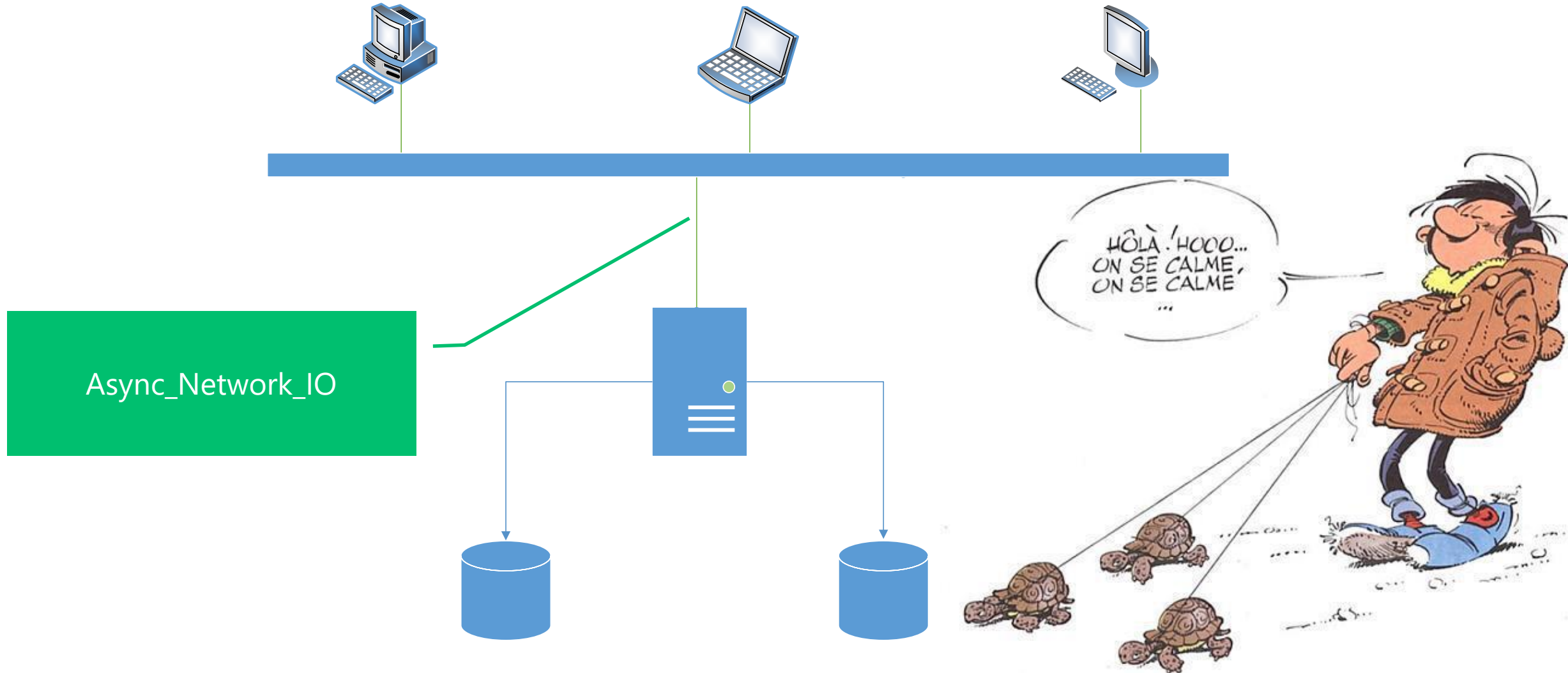
Latches

IOs

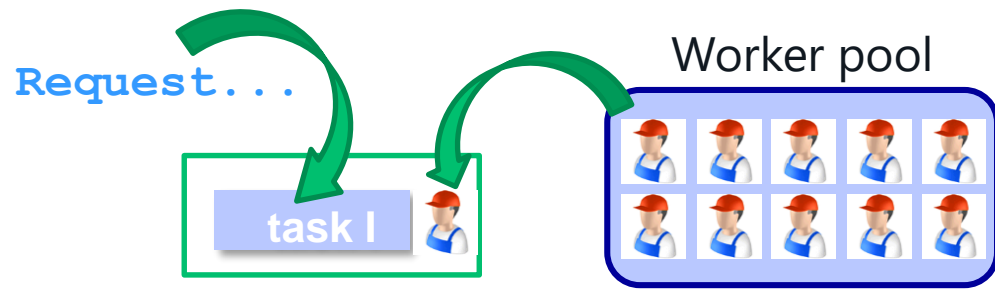


Waits / Resource Queues  
(resource\_wait\_time)

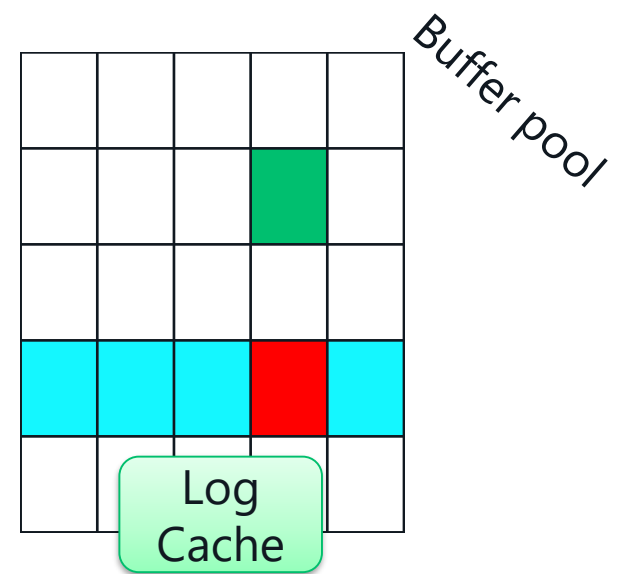
# Async\_network\_io



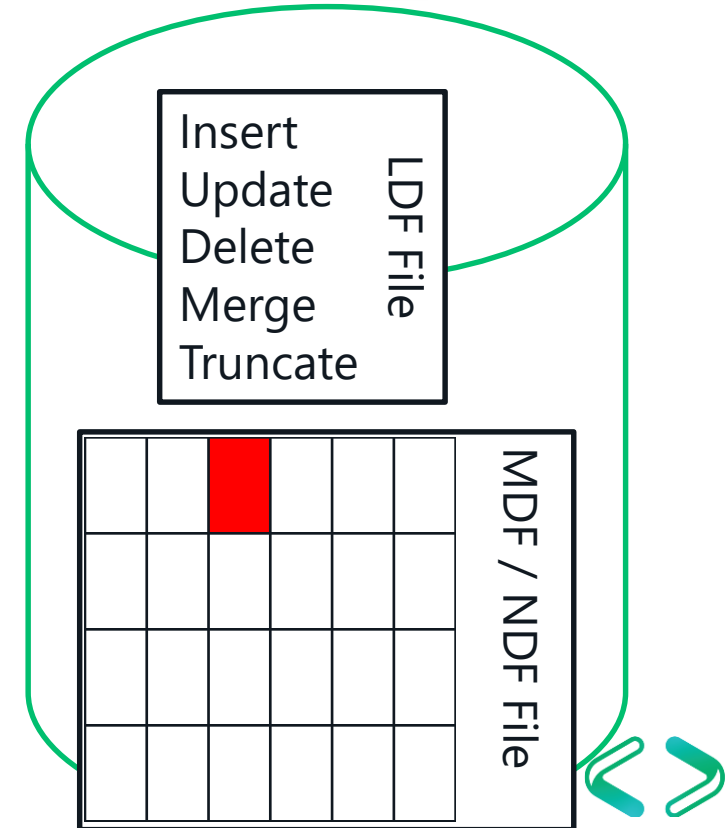
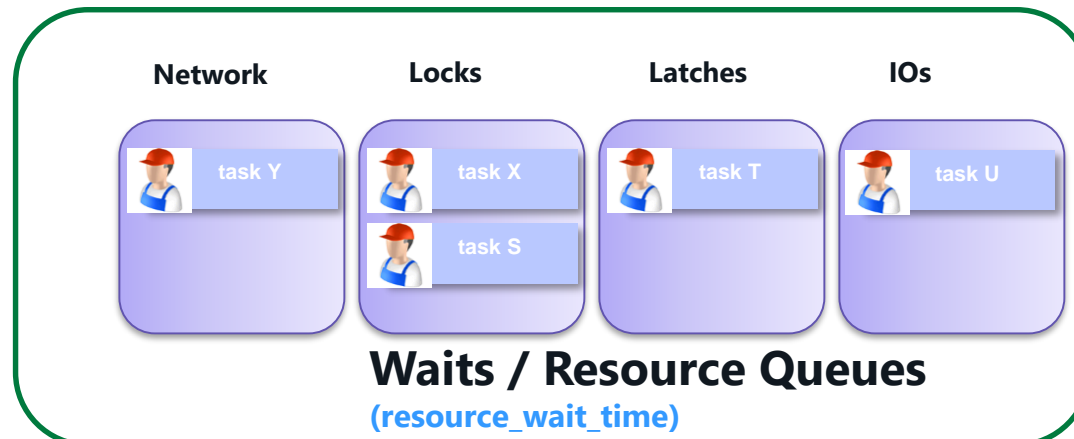
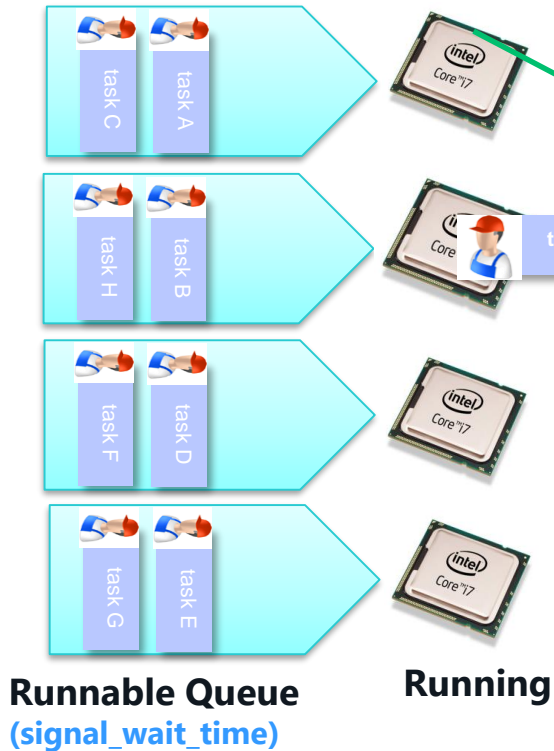




Free List



SOS\_Scheduler\_Yield  
CXPack



# "Technique" wait and queues

Approche pragmatique

Bibliographie (entre autres)

SQL Server 2005 Waits and Queues (Tom Davidson)

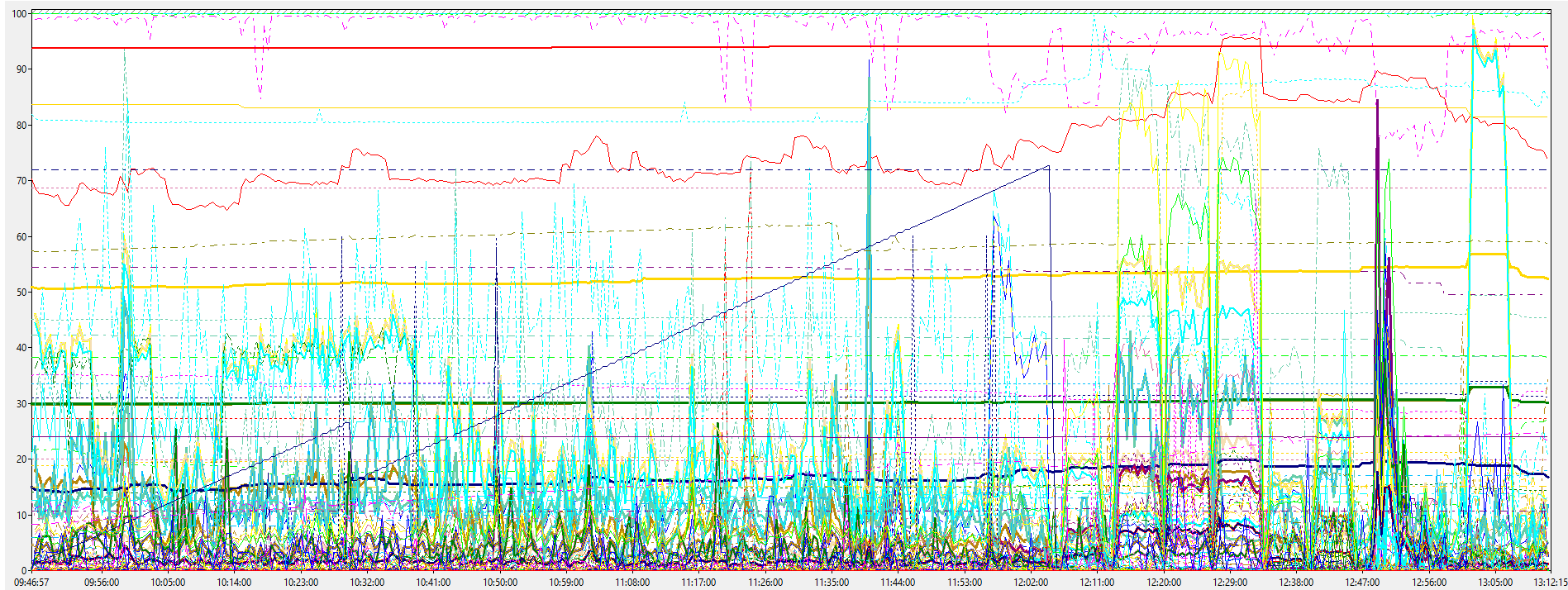
Performance Tuning Using Wait Statistics (Jonathan Kehayias, Erin Stellato)

Performance Tuning With Wait Statistics (Joe Sack)

Description des attentes

<https://www.sqlskills.com/help/waits/>





# Compteurs de performance

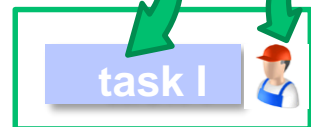
Approche très système

Près de 600 indicateurs différents

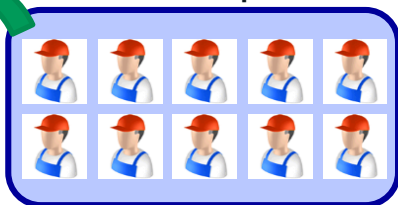
Surveillance et détection de goulots d'étranglement



Request...



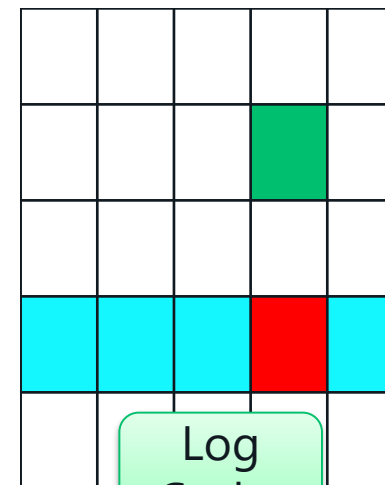
Worker pool



Free List



Buffer pool



Log  
Cache

SQL Server Databases : Percent Log Used  
SQL Server Databases : Log Flush Wait Time  
SQL Server Databases : Log Flush Waits/Sec

Logical Disk : Avg Disk Queue Length  
**Logical Disk : Avg Disk Sec / Reads**  
**Logical Disk : Avg Disk Sec / Writes**

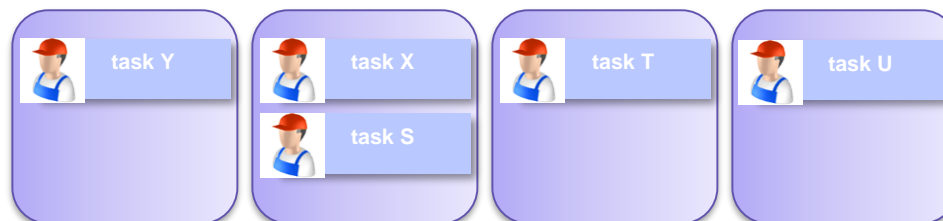
Insert  
Update  
Delete  
Merge  
Truncate

LDLF File

MDF / NDF File

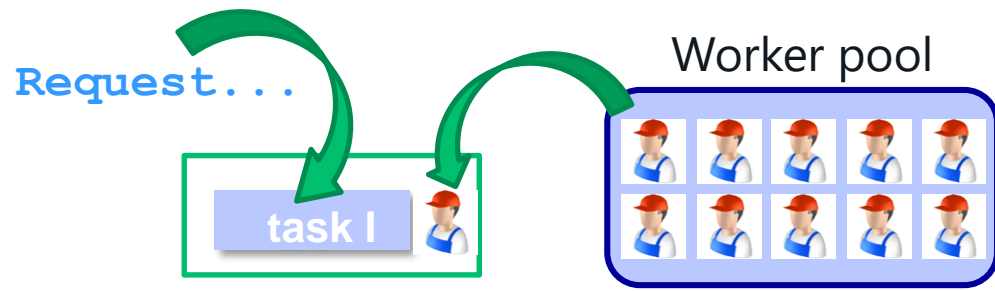
Runnable Queue  
(signal\_wait\_time)

Running

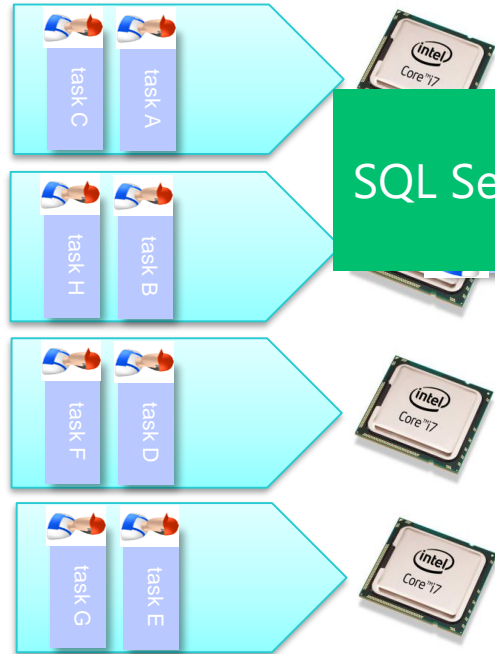
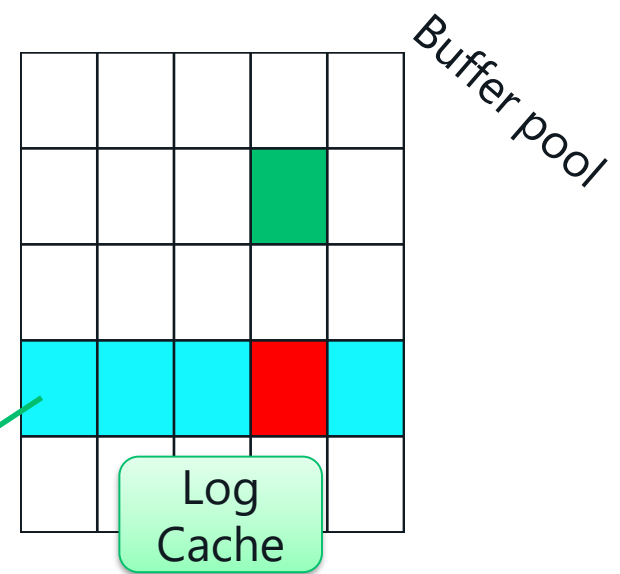


**Waits / Resource Queues**  
(resource\_wait\_time)

IOs



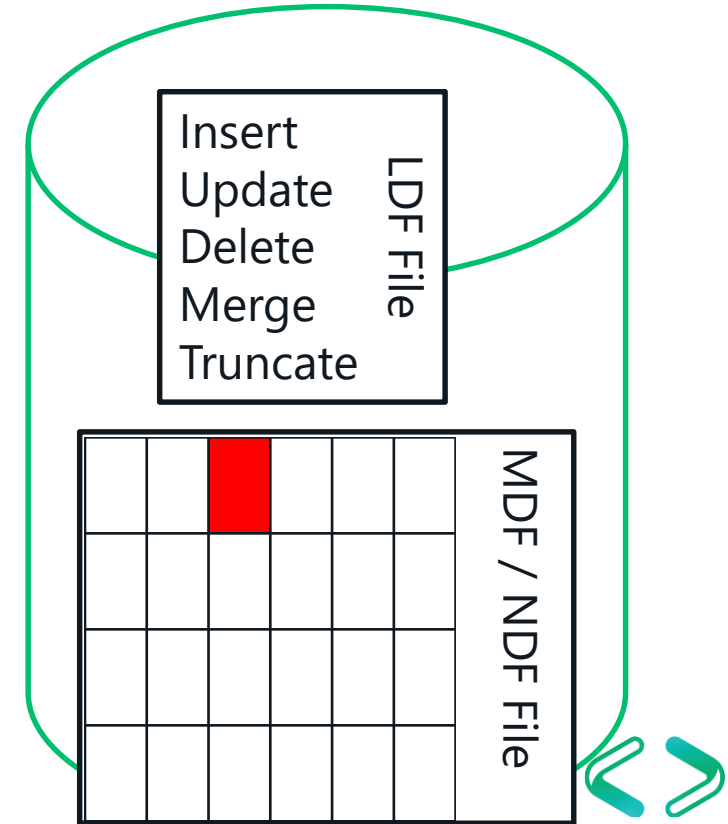
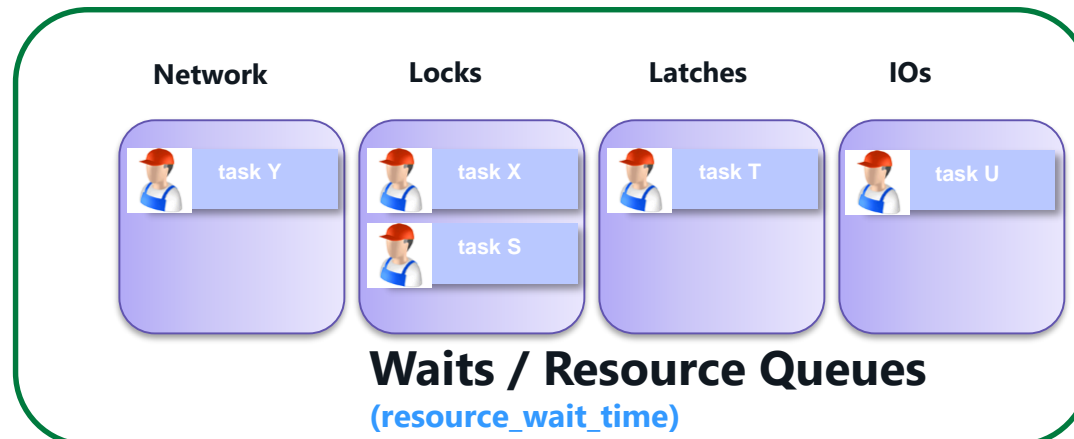
Free List



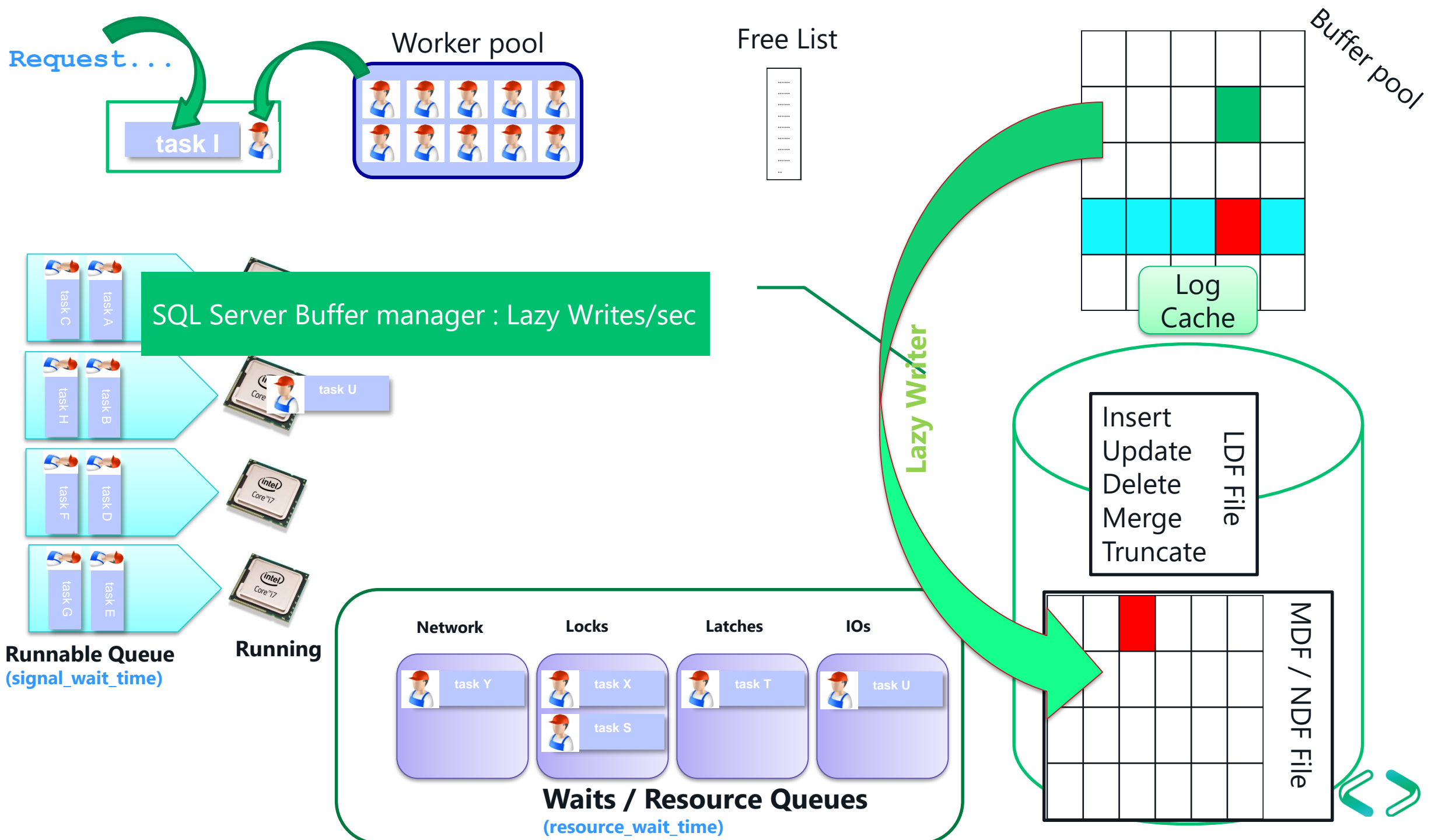
SQL Server Buffer Manager : Page Life Expectancy

**Runnable Queue**  
(signal\_wait\_time)

**Running**

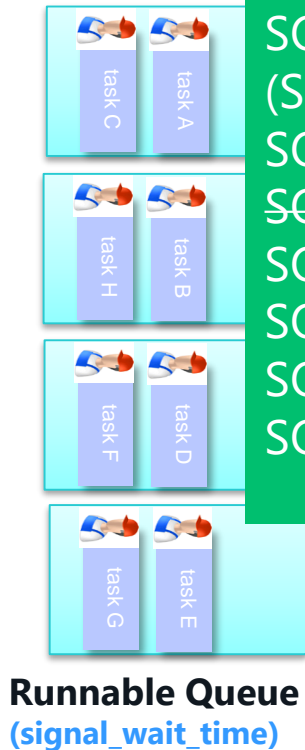




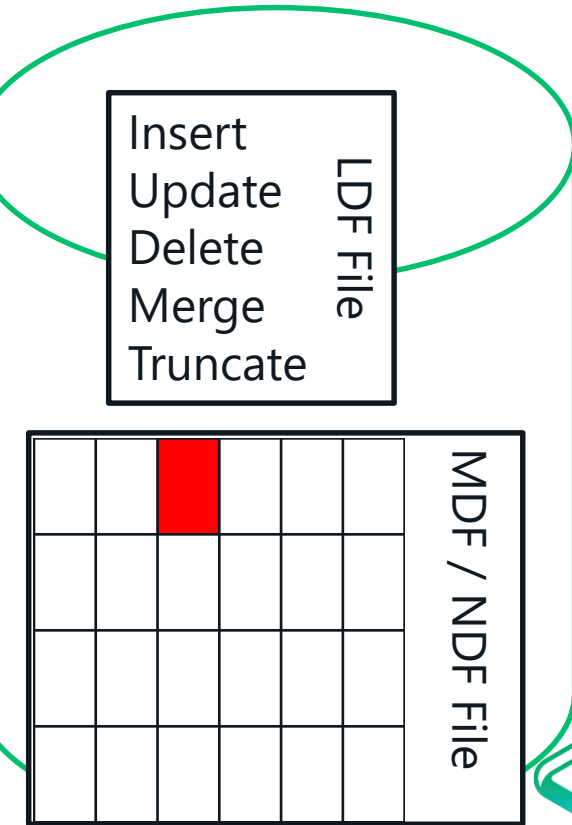
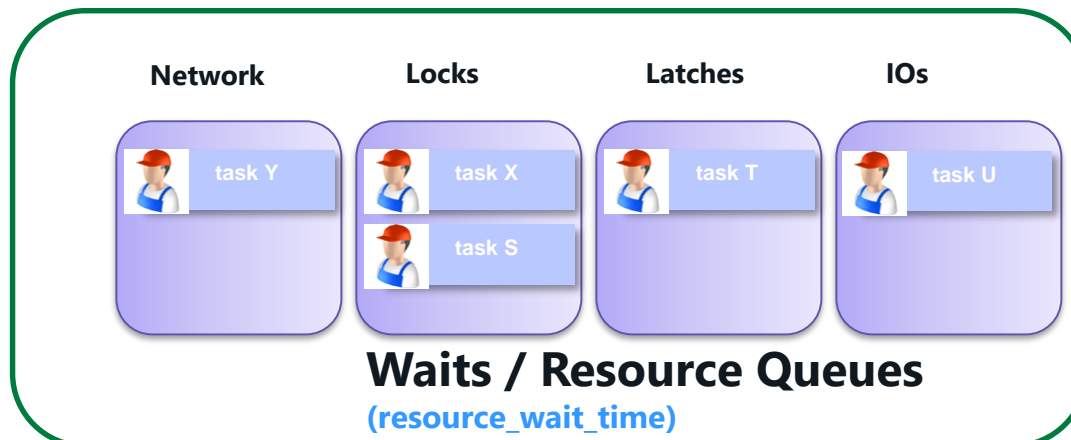




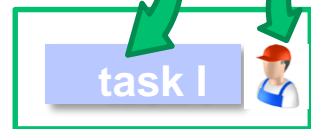
SQL Server Access Methods : Full Scans/Sec  
 (SQL Server Access Methods : Page Splits/Sec)  
 SQL Server Access Methods : Forwarded Records/Sec  
 SQL Server Locks : Lock Requests/sec  
 SQL Server Locks : Lock Wait Time (ms)  
 SQL Server Locks : Lock Waits/sec  
 SQL Server Locks : Lock Timeouts/sec  
 SQL Server Locks : Number of Deadlocks/sec



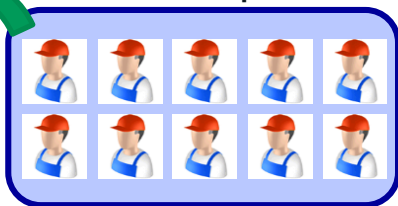
**Running**



Request...



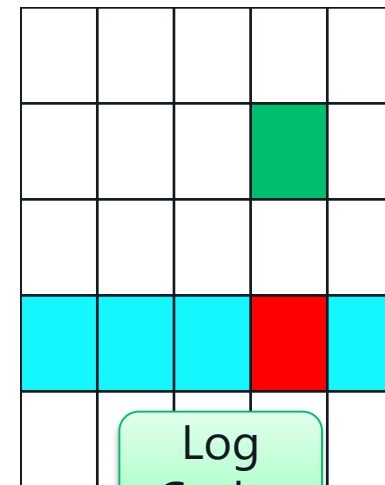
Worker pool



Free List



Buffer pool



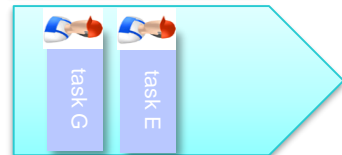
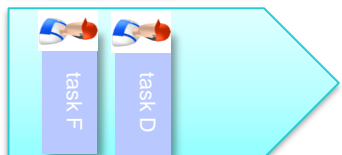
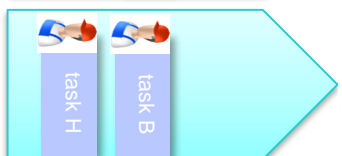
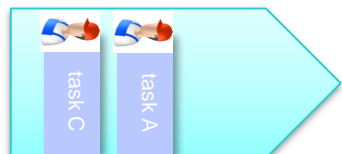
Log  
Cache

Processor : % Processor Time [Total]  
Processor : % Privilege Time  
Processor : % User Time

Insert  
Update  
Delete  
Merge  
Truncate

LDLF File

MDF / NDF File



Runnable Queue  
(signal\_wait\_time)



Running

Network

Locks

Latches

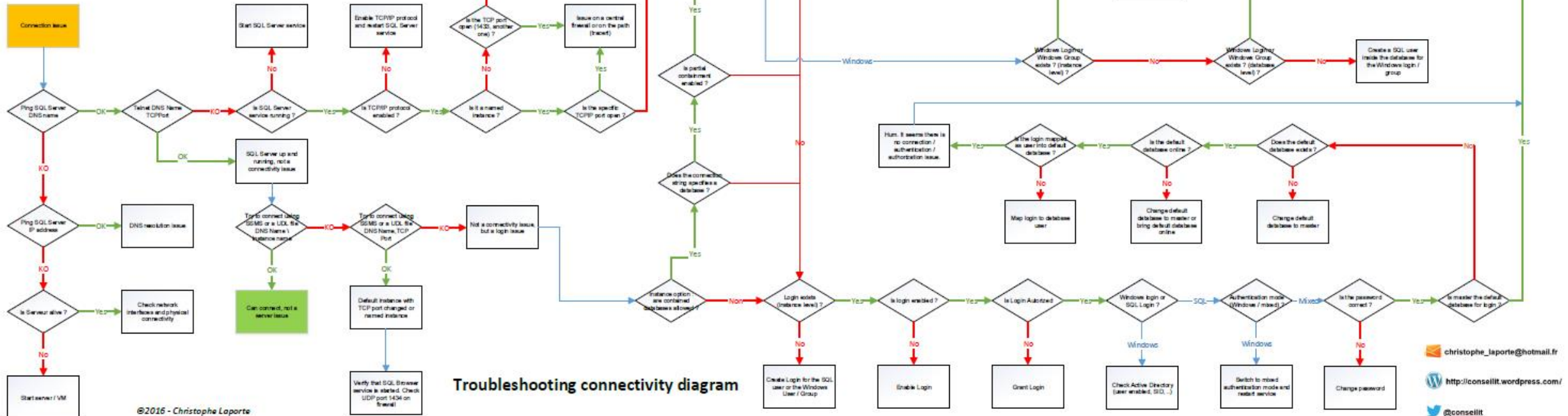
IOs



Waits / Resource Queues  
(resource\_wait\_time)

# Connectivité & connexion

<http://bit.ly/2wORxHH>



# Outils à disposition

## SSMS

Requêtes DMVs / DMFs

xEvents

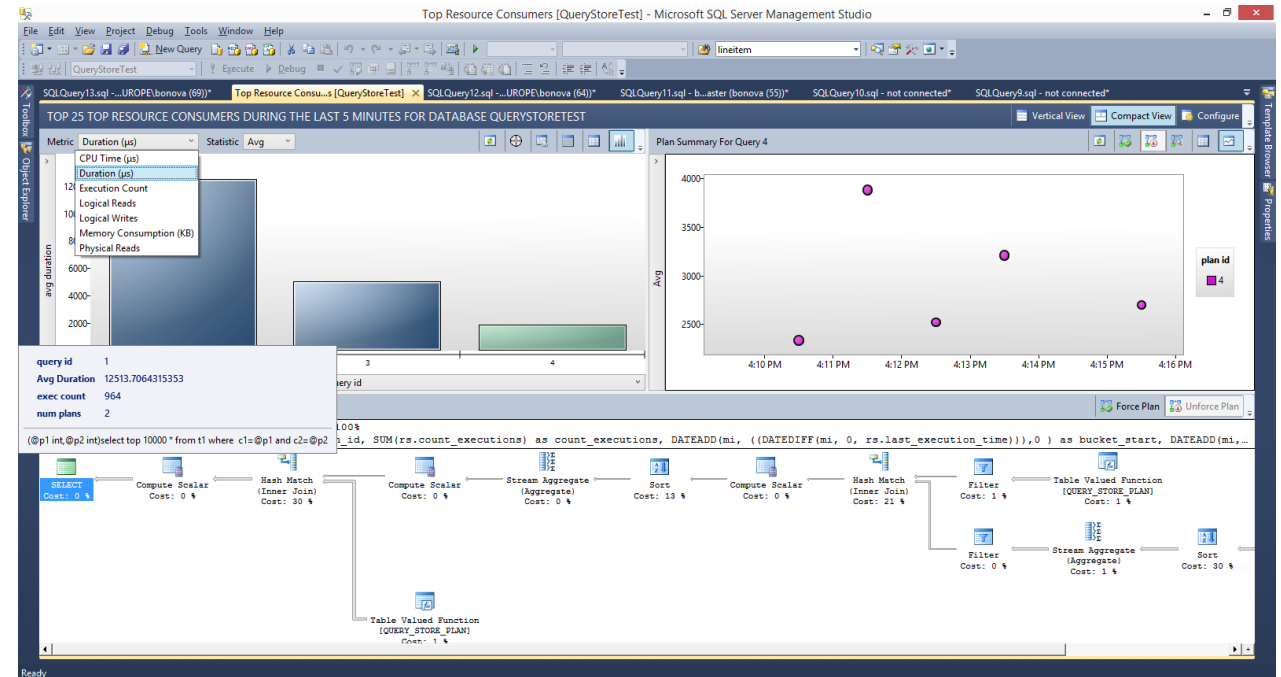
Plans d'exécution

Activity Monitor

Blocked Process Reports

(SQL Server Profiler)

Query Store



# Outils à disposition

## PSSDiag/SQLDiag & SQLNexus

Analyse de problèmes de performance  
SQLDiag

Collection de données (event log Windows, fichier BLG, Traces, Errorlog, ..)

SQLNexus

Orienté restitution graphique (blocages, attentes, analyse des traces)

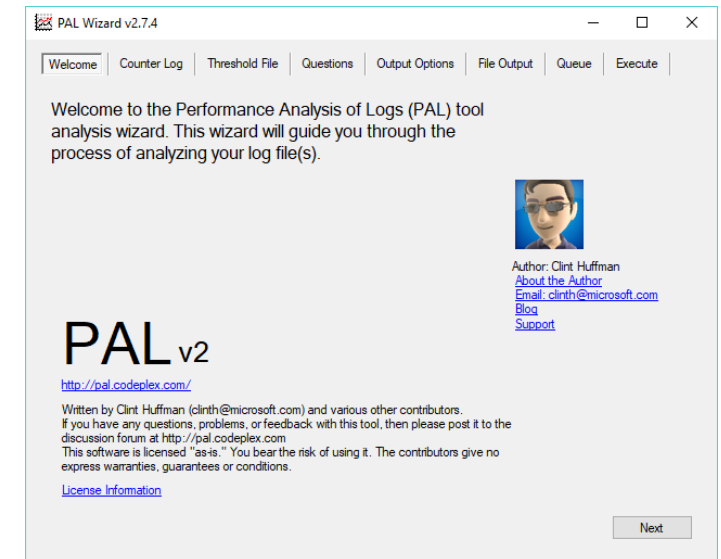
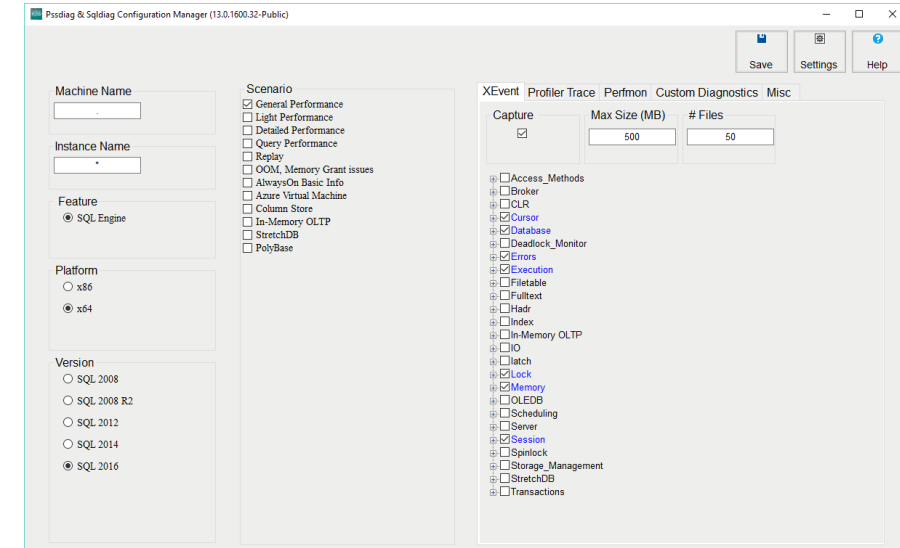
## PAL

Collection de compteurs -> fichier BLG

Pas seulement réservé à SQL Server

Rapports

Simplicité d'emploi





# Outils à disposition

## Outils de monitoring / alerting

Nagios / Centreon / Zabbix / Cacti

Microsoft SCOM

Solarwinds

PRTG

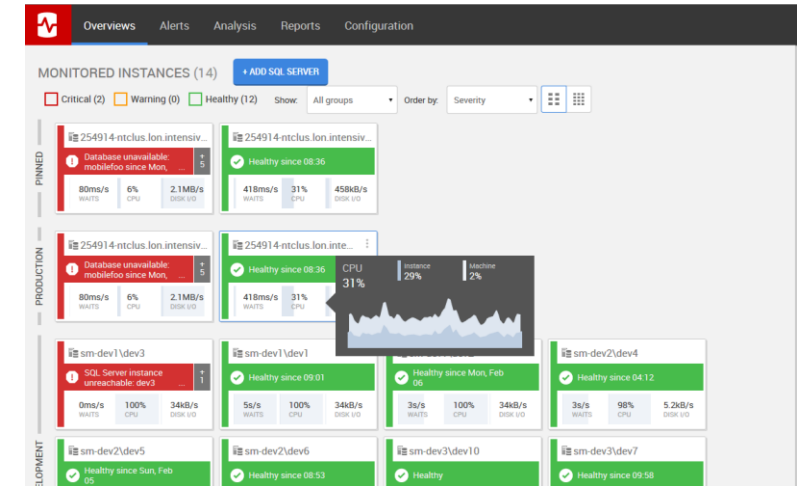
RedGate SQLMonitor

SentryOne SQLSentry

Quest Foglight / Spotlight

Idera SQL Diagnostic Manager

Kankuru



# Conclusion

Problèmes les plus courants :

- IO disque (latence)
- Verrouillage excessif
- Statistiques hors d'âge
- Gestion du parallélisme
- Application client (RBAR, ...)

Importance d'une bonne configuration

- Host / VM
- Windows
- SQL

Plan de maintenance (Gestion des index / statistiques d'index)

Un peu de méthode, un peu d'expérience et quelques outils suffisent

Offrez vous un audit 😊

