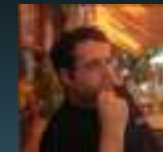




**SOLID
QUALITY
MENTORS**

Eventos Extendidos: ¿hasta donde quieres llegar?

ELADIO RINCÓN



Eventos Extendidos

¿hasta donde llegábamos pre-2008?

- Monitorizamos a alto nivel
 - Waits, fileio, perfmon
- Afinamos poco a poco
 - Filtros profiler, DMVs query_*
- Es complicado cruzar ambos «mundos»
 - **YA puedes poner puntos de seguimiento a alto nivel y filtrar a bajo nivel**



AGENDA

- Conceptos
- Ciclo de Vida de Eventos
- Ejemplos

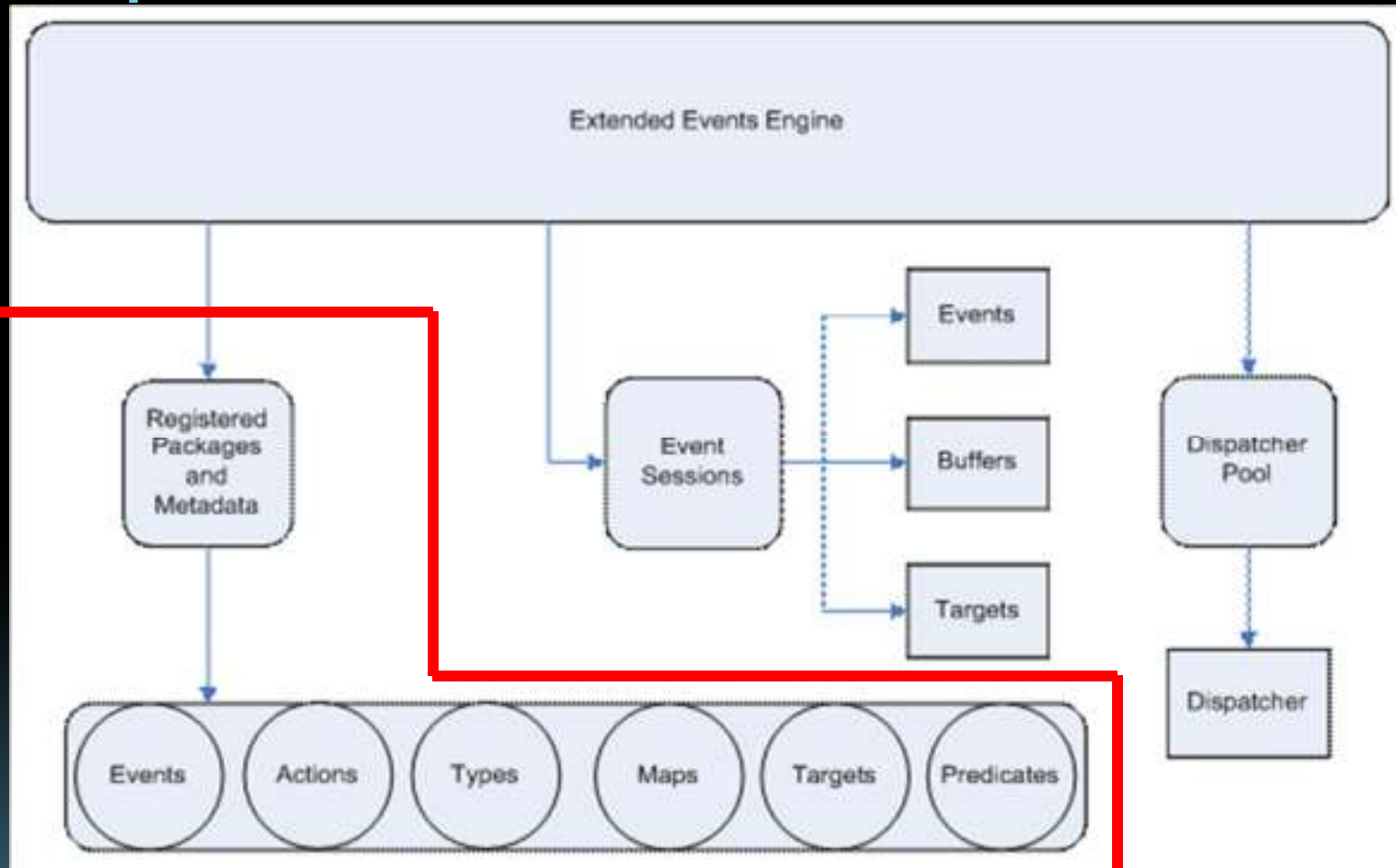


Eventos Extendidos

¿Qué son?

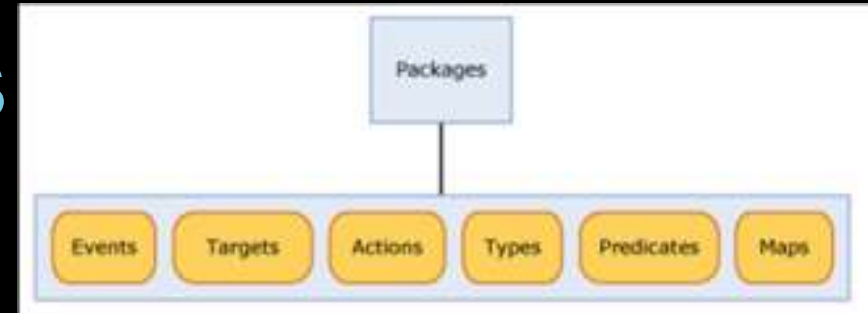
- Nueva infraestructura de Eventos
- Super configurable y flexible
- Permite tracing desde Windows (ETW)
- Muy eficiente y con mínimo impacto

Eventos Extendidos Arquitectura



Eventos Extendidos

Conceptos

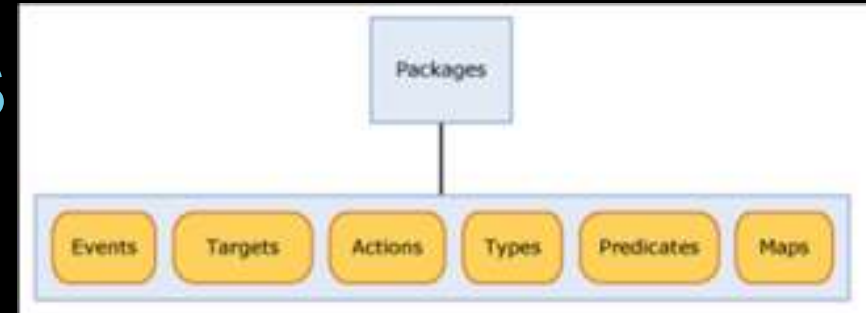


- Packages
 - Donde están contenidos los eventos
 - DMV: `sys.dm_xe_packages`

	name	description	capabilities_desc
1	package0	Default package. Contains all standard types, maps, compare operators, actions and targets	utility
2	sqlos	Extended events for SQL Operating System	NULL
3	sqlserver	Extended events for Microsoft SQL Server	NULL
4	SecAudit	Security Audit Events	private

Eventos Extendidos

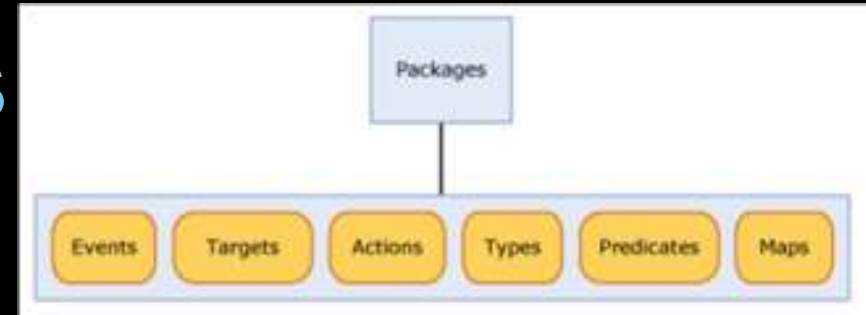
Conceptos



- Eventos
 - Punto de interés en el código
 - DMV: sys. dm_xe_objects
 - 4 tipos para alinearlos con ETW
 - Admin, Analytical, Debug, Operational

	package	keyword	channel	count		package	keyword	channel	count		package	keyword	channel	count
1	sqlos	exception	Debug	3	14	sqlserver	change_tracking	Debug	1	28	sqlserver	io	Debug	2
2	sqlos	io	Debug	2	15	sqlserver	clr	Debug	2	29	sqlserver	io	Operational	1
3	sqlos	memory	Debug	10	16	sqlserver	cursor	Analytic	11	30	sqlserver	latch	Analytic	4
4	sqlos	process	Debug	12	17	sqlserver	database	Analytic	15	31	sqlserver	lock	Analytic	6
5	sqlos	scheduling	Debug	19	18	sqlserver	database	Debug	1	32	sqlserver	memory	Debug	2
6	sqlos	scheduling	Operational	2	19	sqlserver	database	Operational	5	33	sqlserver	replication	Debug	7
7	sqlos	synchronization	Debug	1	20	sqlserver	deadlock_monitor	Admin	1	34	sqlserver	server	Admin	2
8	sqlserver	NULL	Debug	3	21	sqlserver	deadlock_monitor	Debug	5	35	sqlserver	server	Analytic	15
9	sqlserver	access_methods	Debug	6	22	sqlserver	errors	Admin	2	36	sqlserver	server	Debug	2
10	sqlserver	broker	Admin	2	23	sqlserver	errors	Debug	2	37	sqlserver	server	Operational	2
11	sqlserver	broker	Analytic	5	24	sqlserver	errors	Operational	1	38	sqlserver	transactions	Analytic	2
12	sqlserver	broker	Debug	66	25	sqlserver	execution	Analytic	12					
13	sqlserver	cdc_logscan	Debug	2	26	sqlserver	execution	Debug	2					
					27	sqlserver	io	Analytic	14					

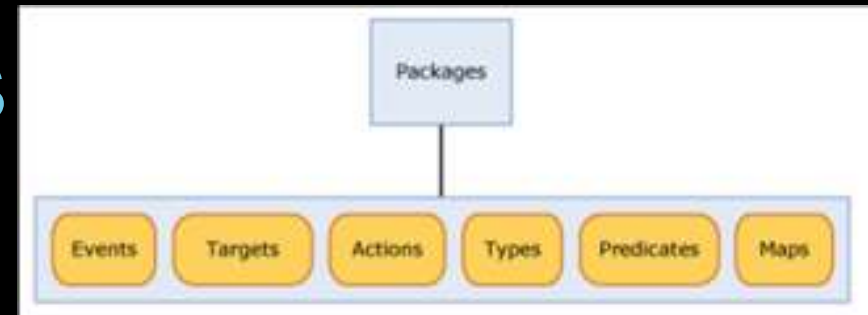
Eventos Extendidos Conceptos



- Cada evento expone columnas
 - Generales de solo lectura
 - De datos del evento
 - También hay algunas personalizables (customizable)

	PackageName	EventName	column_id	column_type	ColumnName	column_value	description
1	sqlserver	lock_acquired	0	data	resource_type	NULL	NULL
2	sqlserver	lock_acquired	1	data	mode	NULL	NULL
3	sqlserver	lock_acquired	2	data	owner_type	NULL	NULL
4	sqlserver	lock_acquired	3	data	transaction_id	NULL	NULL
5	sqlserver	lock_acquired	4	data	database_id	NULL	NULL
6	sqlserver	lock_acquired	5	data	lockspace_workspace_id	NULL	NULL
7	sqlserver	lock_acquired	6	data	lockspace_sub_id	NULL	NULL
8	sqlserver	lock_acquired	7	data	lockspace_nest_id	NULL	NULL
9	sqlserver	lock_acquired	8	data	resource_0	NULL	NULL
10	sqlserver	lock_acquired	9	data	resource_1	NULL	NULL
11	sqlserver	lock_acquired	10	data	resource_2	NULL	NULL
12	sqlserver	lock_acquired	0	readonly	ID	68	Numeric ID
13	sqlserver	lock_acquired	1	readonly	UUID	6D74001D-F4F9-425E-9DAE-7706FD43F98D	Globally Unique ID
14	sqlserver	lock_acquired	2	readonly	VERSION	1	Event schema version
15	sqlserver	lock_acquired	3	readonly	CHANNEL	2	ETW Channel
16	sqlserver	lock_acquired	4	readonly	KEYWORD	64	Associated Keyword

Eventos Extendidos Conceptos

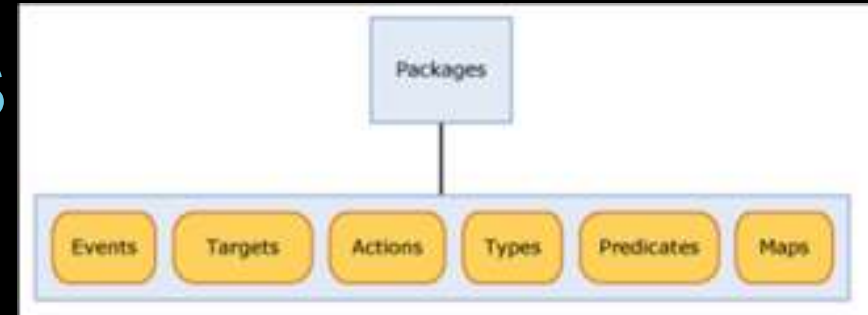


- Acciones:
 - Información adicional a incluir con el evento
 - Síncrono con el evento

	PackageName	ActionName	ActionDescription		PackageName	ActionName	ActionDescription
1	package0	attach_activity_id	Attach an activity ID to an event	19	sqlserver	client_app_name	Collect client application name
2	package0	attach_activity_id_xfer	Attach an activity ID transfer to an event	20	sqlserver	client_hostname	Collect client hostname
3	package0	callstack	16-frame call stack	21	sqlserver	client_pid	Collect client process ID
4	package0	collect_cpu_cycle_time	Collect the current CPU's cycle count	22	sqlserver	create_dump_all_threads	Create mini dump including all threads
5	package0	collect_system_time	Collect the current system time with 100 mi...	23	sqlserver	create_dump_single_thread	Create mini dump for the current thread
6	package0	debug_break	Break the process in the default debugger	24	sqlserver	database_context	Collect useful information related to the curr...
7	sqlos	cpu_id	Collect current CPU ID	25	sqlserver	database_id	Collect database ID
8	sqlos	node_affinity	Collect current NUMA node affinity	26	sqlserver	is_system	Collect whether current session is system
9	sqlos	scheduler_address	Collect current scheduler address	27	sqlserver	nt_username	Collect NT username
10	sqlos	scheduler_id	Collect current scheduler ID	28	sqlserver	plan_handle	Collect plan handle
11	sqlos	sos_context	Collect useful information related to SOS	29	sqlserver	request_id	Collect current request ID
12	sqlos	system_thread_id	Collect current system thread ID	30	sqlserver	session_id	Collect session ID
13	sqlos	task_address	Collect current task address	31	sqlserver	session_nt_username	Collect session's NT username
14	sqlos	task_elapsed_quantum	Collect current task quantum time	32	sqlserver	session_resource_group_id	Collect current session resource group ID
15	sqlos	task_resource_group_id	Collect current task resource group ID	33	sqlserver	session_resource_pool_id	Collect current session resource pool ID
16	sqlos	task_resource_pool_id	Collect current task resource pool ID	34	sqlserver	sql_text	Collect SQL text
17	sqlos	task_time	Collect current task execution time	35	sqlserver	transaction_id	Collect transaction ID
18	sqlos	worker_address	Collect current worker address	36	sqlserver	tag_stack	Collect Transact-SQL stack
				37	sqlserver	username	Collect username

Eventos Extendidos

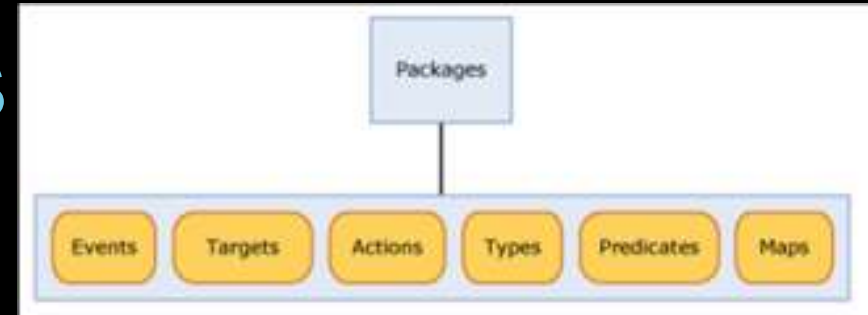
Conceptos



- Predicados: filtros sobre
 - Columnas del evento
 - Columnas personalizadas (customizable)
 - Eventos añadidos (acciones)
- Ejemplos:
 - Eventos: tipo de bloqueo, duración, base de datos, ...
 - Acciones: usuario, BD, app_cliente, host_name, ...

Eventos Extendidos

Conceptos

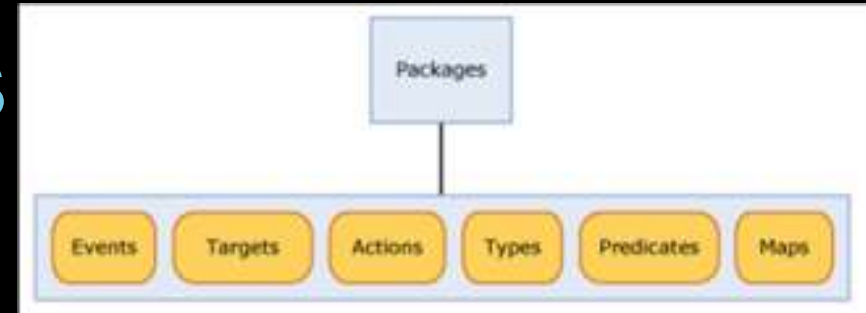


- Target: Donde se registra el evento
 - Síncrono / asíncrono
 - Memoria / disco
 - Cada uno con sus propios parámetros
 - Ruta donde guardar, memoria máxima, eventos de cruce

	TargetName	TargetDescription
1	asynchronous_bucketizer	Asynchronous bucketizing target
2	asynchronous_file_target	Asynchronous file target
3	etw_classic_sync_target	Event Tracing for Windows (ETW) Synchronous Target
4	pair_matching	Pairing target
5	ring_buffer	Asynchronous ring buffer target.
6	synchronous_bucketizer	Synchronous bucketizing target
7	synchronous_event_counter	Synchronous Counter target

Eventos Extendidos

Conceptos

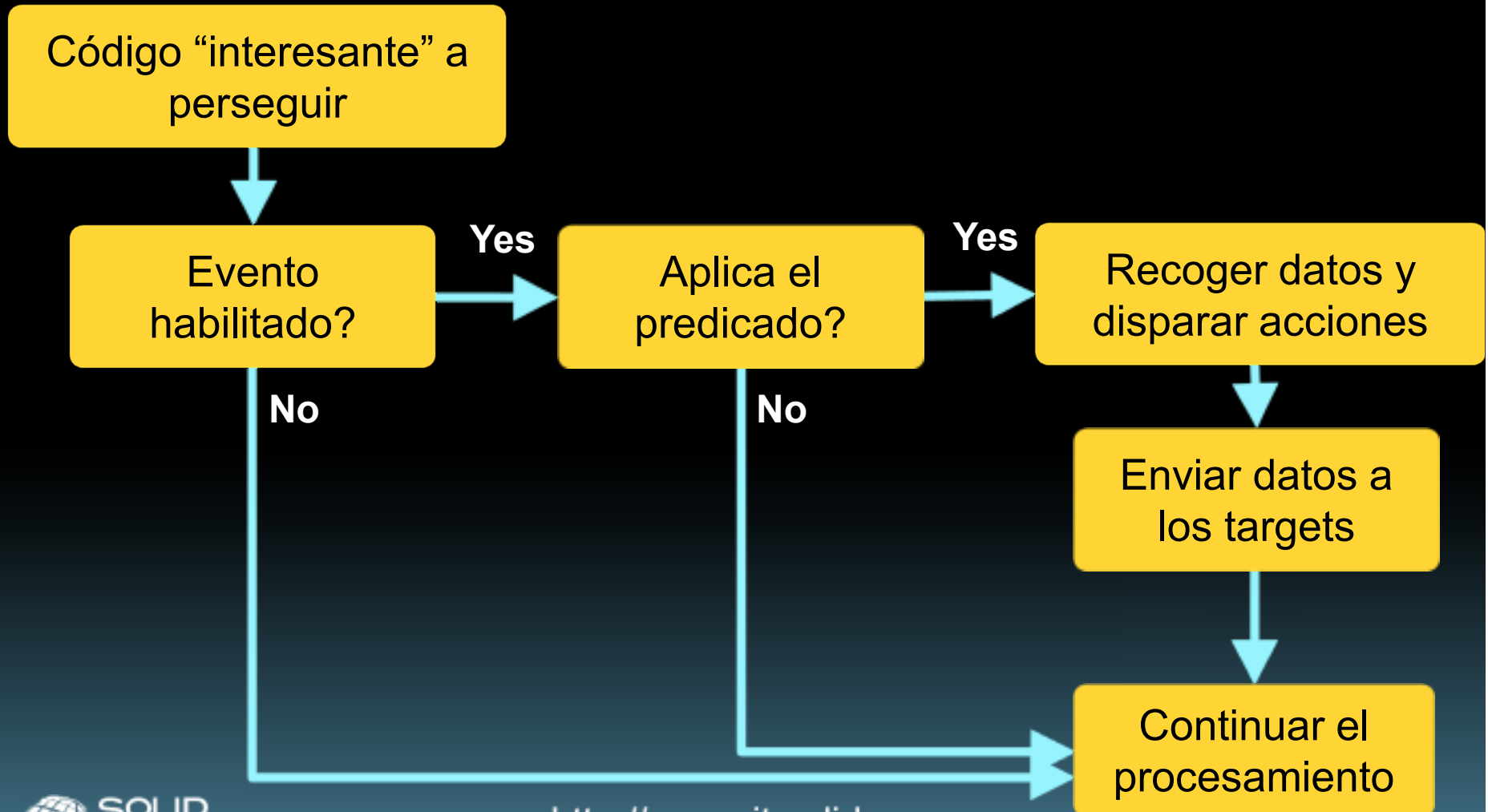


- Mapas: lookups de claves hacia descripción

	name	map_key	map_value		name	map_key	map_value
1	lock_mode	0	NL	13	lock_mode	12	BU
2	lock_mode	1	SCH_S	14	lock_mode	13	RS_S
3	lock_mode	2	SCH_M	15	lock_mode	14	RS_U
4	lock_mode	3	S	16	lock_mode	15	RI_NL
5	lock_mode	4	U	17	lock_mode	16	RI_S
6	lock_mode	5	X	18	lock_mode	17	RI_U
7	lock_mode	6	IS	19	lock_mode	18	RI_X
8	lock_mode	7	IU	20	lock_mode	19	RX_S
9	lock_mode	8	IX	21	lock_mode	20	RX_U
10	lock_mode	9	SIU	22	lock_mode	21	RX_X
11	lock_mode	10	SIX	23	lock_mode	21	RX_X
12	lock_mode	11	UIX				



Eventos Extendidos Ciclo de Vida



Eventos Extendidos

DMVs: Qué puedo hacer

- `sys.dm_xe_packages`
- `sys.dm_xe_objects`
- `sys.dm_xe_object_columns`
- `sys.dm_xe_map_values`

Eventos Extendidos

DMVs: Qué está configurado

- `sys.server_event_sessions`
- `sys.server_event_session_actions`
- `sys.server_event_session_events`
- `sys.server_event_session_fields`
- `sys.server_event_session_targets`

Eventos Extendidos

DMVs: Qué se está ejecutando

- `sys.dm_xe_sessions`
- `sys.dm_xe_session_targets`
- `sys.dm_xe_session_object_columns`
- `sys.dm_xe_session_events`
- `sys.dm_xe_session_event_actions`

Eventos Extendidos

DDL: Cómo creo sesiones

- CREATE EVENT SESSION
- ALTER EVENT SESSION ... STATE=START
- ALTER EVENT SESSION ... STATE=STOP
- DROP EVENT SESSION



DEMO



<http://summit.solidq.com>

RESUMEN: Eventos Extendidos

- Versión 1:
 - Familiarízate para el futuro
 - Usado si cubre lo que necesitas
- Muy robustos y diseñados pensando en eficiencia
- La puedes pifiar igual que en SQL Profiler
- Complicado aprender XML
- Complicado convertir en TSQL lo que buscas → desde XML

