



Instituto Tecnológico de Culiacán



Administración de Bases de Datos

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Horario: 6:00pm – 7:00pm

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/*PROYECTO DE AUDITORIAS*/
/*1.- Proponer un método de Auditar el comando select sobre todas la tablas de la
base de datos Norhwind.

```

Realizar 5 consultas y exponga el método de revisión de la auditoria.*/

```

SELECT * FROM FN_GET_AUDIT_FILE('C:\Auditorias\*', DEFAULT, DEFAULT)

```

```

SELECT * FROM EMPLOYEES
SELECT * FROM CUSTOMERS
SELECT * FROM PRODUCTS
SELECT * FROM REGION
SELECT * FROM CATEGORIES

```

Name:	abaseAuditSpecification:20220516-136651				
Audit:	Audit:20220516-134918				
Actions:					
	Audit Action Type	Object Class	Object Schema	Object Name	Principal Name
1	SELECT	OBJECT	dbo	Employees	public
2	SELECT	OBJECT	dbo	Customers	public
3	SELECT	OBJECT	dbo	Products	public
4	SELECT	OBJECT	dbo	Region	public
5	SELECT	OBJECT	dbo	Categories	public

```
--1.-
SELECT * FROM FN_GET_AUDIT_FILE('C:\Auditorias\*', DEFAULT, DEFAULT)

SELECT * FROM EMPLOYEES
SELECT * FROM CUSTOMERS
SELECT * FROM PRODUCTS
SELECT * FROM REGION
SELECT * FROM CATEGORIES
```

event_time	sequence_number	action_id	succeeded	permission_bitmask	is_column_permission	session_id	server_principal_id	database_principal_id	target_server_principal_id	target_database_principal_id	of
2022-05-16 19:51:37.5553713	1	AUSC	1	0x00000000000000000000000000000000	0	59	1	0	0	0	0
2022-05-16 20:07:21.2232973	1	SL	1	0x00000000000000000000000000000001	1	65	1	1	0	0	5
2022-05-16 20:07:23.9593270	1	SL	1	0x00000000000000000000000000000001	1	65	1	1	0	0	6
2022-05-16 20:07:27.2622641	1	SL	1	0x00000000000000000000000000000001	1	65	1	1	0	0	8
2022-05-16 20:07:29.6727473	1	SL	1	0x00000000000000000000000000000001	1	65	1	1	0	0	1
2022-05-16 20:07:32.0007067	1	SL	1	0x00000000000000000000000000000001	1	65	1	1	0	0	6

/*2.- Proponer un método para auditar la ejecución de todos los procedimientos almacenados de la bd Northwind.

Crear dos procedimientos almacenado y exponga el método de revisión de la auditoría.*/

```
CREATE PROC SP_CLIENTES
```

```
AS
```

```
BEGIN
```

```
    SELECT * FROM CUSTOMERS
```

```
END
```

```
GO
```

```
CREATE PROC SP_EMPLEADOS
```

```
AS
```

```
BEGIN
```

```
    SELECT * FROM EMPLOYEES
```

```
END
```

```
GO
```

```
SELECT * FROM FN_GET_AUDIT_FILE('C:\Auditorias\*', DEFAULT, DEFAULT) WHERE action_id = 'EX'
```

```
EXECUTE SP_CLIENTES
```

```
EXECUTE SP_EMPLEADOS
```

Name:

abaseAuditSpecification-20220516-142620

Audit:

Audit-20220516-141801

Actions:

	Audit Action Type	Object Class	Object Schema	Object Name	Principal Name
1	EXECUTE	OBJECT	dbo	SP_CLIENTES	public
2	EXECUTE	OBJECT	dbo	SP_EMPLEADOS	public

```
--2.-
CREATE PROC SP_CLIENTES
AS
BEGIN
    SELECT * FROM CUSTOMERS
END
GO
CREATE PROC SP_EMPLEADOS
AS
BEGIN
    SELECT * FROM EMPLOYEES
END
GO
SELECT * FROM FN_GET_AUDIT_FILE('C:\Auditorias\*', DEFAULT, DEFAULT) WHERE action_id = 'EX'
EXECUTE SP_CLIENTES
EXECUTE SP_EMPLEADOS
```

99 %

Results Messages

	event_time	sequence_number	action_id	succeeded	permission_bitmask	is_column_permission	session_id	server_principal_id	database_principal_id	target_server_principal_id	target_database_principal_id	object_id
1	2022-05-16 20:30:31.5435125	1	EX	1	0x00000000000000000000000000000000	0	65	1	1	0	0	1426235f
2	2022-05-16 20:30:34.1062258	1	EX	1	0x00000000000000000000000000000000	0	65	1	1	0	0	1586236f

```

/*3.- Utilizando trigger DDL a nivel servidor auditar la creación, eliminación o
modificación de base de datos y de inicios de sesión.
    Grabar en una tabla:
        ID
        fecha del evento,
        inicio de sesión,
        acción,
        sentencia y
        detalle del evento XML.
    Realizar 5 acciones sobre base de datos y 5 acciones sobre inicios de
sesión.*/
use master
go
create table LogCambiosDDLServeridor(
ID int identity primary key,
Fecha datetime not null constraint DF_LogCambiosDDL_FechaCambio default (GetDate()),
InicioSesion varchar(500) not null,
Accion varchar(500) not null,
Sentencia varchar(max) not null,
DetalleEvento xml not null
)
go
-- Trigger DLL sobre base de datos
create trigger trBD_Problema_3
on all server
for CREATE_DATABASE, ALTER_DATABASE, DROP_DATABASE,
DDL_SERVER_SECURITY_EVENTS
as
begin
    set nocount on;
    -- Declaracion de variables de proceso
    declare @InfoEvento xml, @Accion varchar(500), @Objeto varchar(500),
@Sentencia varchar(max)
    -- 1.- Captura de evento en variable principal
    set @InfoEvento = EVENTDATA();

    -- 2.- Consumir informacio en variables secundarias usando xQuery
    -- Captura la accion DDL (Si es create, alter o drop)
    set @Accion =
@InfoEvento.value('(/EVENT_INSTANCE/EventType)[1]', 'varchar(500)')

    -- Capturamos las sentencias ejecutadas
    set @Sentencia =
@InfoEvento.value('(/EVENT_INSTANCE/TSQLCommand)[1]', 'varchar(max)')

    -- 3.- Almacenar detalles de la accion en tabla log
    insert
LogCambiosDDLServeridor(Fecha,InicioSesion,Accion,Sentencia,DetalleEvento)
values(
    GETDATE(),
    SUSER_NAME(),
    @Accion,
    @Sentencia,
    @InfoEvento
)
end
go
-- Pruebas Inicios de Sesion

```

```

create login Mario with password = '123'
must_change, check_expiration = on
go
create login Marioss with password = '123'
must_change, check_expiration = on
go
sp_addsrvrolemember Marioss, Securityadmin
go
sp_dropsrvrolemember Marioss, Securityadmin
go
drop login Marioss
drop login Mario
select * from LogCambiosDDLServidor
go
-- Pruebas Bases de Datos
create database [Prueba 1]
create database [Prueba 2]
create database [Prueba 3]
go
drop database [Prueba 1]
go
drop database [Prueba 2]
select * from LogCambiosDDLServidor

```

Results		Messages				
	ID	Fecha	InicioSesion	Accion	Sentencia	DetalleEvento
1	25	2022-05-15 17:52:39.247	sa	CREATE_LOGIN	create login Mario with password = '*****' mus...	<EVENT_INSTANCE><EventType>CREATE_LOGIN</EventTyp...
2	26	2022-05-15 17:52:39.247	sa	CREATE_LOGIN	create login Mario with password = '*****' mus...	<EVENT_INSTANCE><EventType>CREATE_LOGIN</EventTyp...
3	27	2022-05-15 17:53:15.663	sa	DROP_LOGIN	drop login Mario	<EVENT_INSTANCE><EventType>DROP_LOGIN</EventType...
4	28	2022-05-15 17:53:15.670	sa	DROP_LOGIN	drop login Mario	<EVENT_INSTANCE><EventType>DROP_LOGIN</EventType...
5	29	2022-05-15 17:54:08.030	sa	CREATE_LOGIN	create login Mario with password = '*****' mus...	<EVENT_INSTANCE><EventType>CREATE_LOGIN</EventTyp...
6	30	2022-05-15 17:54:10.387	sa	CREATE_LOGIN	create login Marioss with password = '*****' m...	<EVENT_INSTANCE><EventType>CREATE_LOGIN</EventTyp...
7	31	2022-05-15 17:54:12.307	sa	ADD_SERVER...	alter server role [Securityadmin] add member [...	<EVENT_INSTANCE><EventType>ADD_SERVER_ROLE_ME...
8	32	2022-05-15 17:54:14.173	sa	DROP_SERVE...	alter server role [Securityadmin] drop member [...	<EVENT_INSTANCE><EventType>DROP_SERVER_ROLE M...
9	33	2022-05-15 17:54:15.703	sa	DROP_LOGIN	drop login Marioss	<EVENT_INSTANCE><EventType>DROP_LOGIN</EventType...
10	34	2022-05-15 17:54:15.710	sa	DROP_LOGIN	drop login Mario	<EVENT_INSTANCE><EventType>DROP_LOGIN</EventType...
11	35	2022-05-15 19:26:53.413	sa	CREATE_DAT...	create database Biblioteca	<EVENT_INSTANCE><EventType>CREATE_DATABASE</Eve...
12	36	2022-05-15 21:45:21.590	sa	DROP_DATAB...	DROP DATABASE [Biblioteca]	<EVENT_INSTANCE><EventType>DROP_DATABASE</EventT...
13	37	2022-05-15 22:02:48.023	sa	CREATE_DAT...	create database Biblioteca	<EVENT_INSTANCE><EventType>CREATE_DATABASE</Eve...

```

/*4.- Utilizando trigger DDL a nivel de base de datos auditar la creación,
eliminación o modificación de tablas vistas,
procedimientos almacenados, funciones y trigger. Grabar en una tabla:
ID,
Fecha del evento,
inicio de sesión,
usuario de base de datos,
acción,
objeto,
sentencia y
detalle del evento XML.
Realizar un comando para vistas, procedimientos almacenados, funciones y
trigger.*/
use NorthWind
go
create table LogCambiosDDL(
ID int identity primary key,
Nivel char(1) not null,
Fecha datetime not null constraint DF_LogCambiosDDL_FechaCambio default (GETDATE()),
InicioSesion varchar(500) not null,
Usuario varchar(500) not null,
Accion varchar(500) not null,
Objeto varchar(500),
Sentencia varchar(max) not null,
DetalleEvento xml not null
)
go
-- Trigger DLL sobre base de datos: Auditoria sobre creacion, modificacion y
eliminacion de tablas/vistas/procedimientos/triggers/funciones
create trigger trDB_AuditoriaCambios
on database
for CREATE_TABLE, ALTER_TABLE, DROP_TABLE,
CREATE_VIEW, ALTER_VIEW, DROP_VIEW,
CREATE_PROCEDURE, ALTER_PROCEDURE, DROP_PROCEDURE,
CREATE_TRIGGER, ALTER_TRIGGER, DROP_TRIGGER,
CREATE_FUNCTION, ALTER_FUNCTION, DROP_FUNCTION
as
begin
set nocount on;
-- Declaracion de variables de proceso
declare @InfoEvento xml, @Accion varchar(500), @Objeto varchar(500),
@Sentencia varchar(max)
-- 1.- Captura de evento en variable principal
set @InfoEvento = EVENTDATA();

-- 2.- Consumir informacion en variables secundarias usando xQuery
-- Captura la accion DDL (Si es create, alter o drop)
set @Accion =
@InfoEvento.value('(/EVENT_INSTANCE/EventType)[1]', 'varchar(500)')

-- Captura el nombre objeto afectado, anteponiendo el nombre del esquema
set @Objeto =
@InfoEvento.value('(/EVENT_INSTANCE/SchemaName)[1]', 'varchar(500)')
+ '.' +
@InfoEvento.value('(/EVENT_INSTANCE/ObjectName)[1]', 'varchar(500)')

-- Capturamos las sentencias ejecutadas

```

```

        set @Sentencia =
@InfoEvento.value('/EVENT_INSTANCE/TSQLCommand)[1]', 'varchar(max)')

        -- 3.- Almacenar detalles de la accion en tabla log
        insert
LogCambiosDDL(Nivel, Fecha, InicioSesion, Usuario, Accion, Objeto, Sentencia, DetalleEvento
)
        values(
            'B', -- Indica que el evento es de tipo base de datos
            GETDATE(),
            SUSER_NAME(),
            CURRENT_USER,
            @Accion,
            @Objeto,
            @Sentencia,
            @InfoEvento
        )
    end
go
-- Pruebas
-- TABLAS
create table TablaTest1 (C1 int, C2 date)
alter table TablaTest1 add C3 bit
drop table TablaTest1
select * from LogCambiosDDL
go
-- VISTAS
create view vw_OrdersPrueba as
select O.OrderID, O.OrderDate, E.LastName, C.CompanyName from Orders O
inner join Employees E on E.EmployeeID = O.EmployeeID
inner join Customers C on C.CustomerID = O.CustomerID
go
alter view vw_OrdersPrueba as
select * from Orders
go
drop view vw_OrdersPrueba
select * from LogCambiosDDL
go
-- TRIGGER
create trigger tr_prueba
on Region for delete as
begin
    select 'Hola'
end
go
alter trigger tr_prueba
on Region for delete as
begin
    select 'Adios'
end
go
drop trigger tr_prueba
select * from LogCambiosDDL
go
-- PROCEDIMIENTOS
create proc sp_Prueba as
begin
    select * from Region

```

```

end
go
alter proc sp_Prueba as
begin
    select * from Customers
end
go
drop proc sp_Prueba
select * from LogCambiosDDL
go

```

	ID	Nivel	Fecha	InicioSesion	Usuario	Accion	Objeto	Sentencia	DetalleEvento
1	1	B	2022-05-15 18:09:55.140	PC1\Carlos V	dbo	CREATE_TABLE	dbo.TablaTest1	create table TablaTest1 (C1 int, C2 date)	<EVENT_INSTANCE><EventType>CREATE_TABLE</EventType>...
2	2	B	2022-05-15 18:09:55.210	PC1\Carlos V	dbo	ALTER_TABLE	dbo.TablaTest1	alter table TablaTest1 add C3 bit	<EVENT_INSTANCE><EventType>ALTER_TABLE</EventType><C...
3	3	B	2022-05-15 18:09:55.227	PC1\Carlos V	dbo	DROP_TABLE	dbo.TablaTest1	drop table TablaTest1	<EVENT_INSTANCE><EventType>DROP_TABLE</EventType><C...
4	4	B	2022-05-15 18:11:32.427	PC1\Carlos V	dbo	CREATE_VIEW	dbo.vw_OrdersPrueba	create view vw_OrdersPrueba as select * from Orderl...	<EVENT_INSTANCE><EventType>CREATE_VIEW</EventType><C...
5	5	B	2022-05-15 18:11:44.363	PC1\Carlos V	dbo	ALTER_VIEW	dbo.vw_OrdersPrueba	alter view vw_OrdersPrueba as select * from Ord...	<EVENT_INSTANCE><EventType>ALTER_VIEW</EventType><P...
6	6	B	2022-05-15 18:11:54.920	PC1\Carlos V	dbo	DROP_VIEW	dbo.vw_OrdersPrueba	drop view vw_OrdersPrueba	<EVENT_INSTANCE><EventType>DROP_VIEW</EventType><P...
7	7	B	2022-05-15 18:15:19.190	PC1\Carlos V	dbo	CREATE_TRIGGER	dbo.tr_prueba	create trigger tr_prueba on Region for delete as ...	<EVENT_INSTANCE><EventType>CREATE_TRIGGER</EventTy...
8	8	B	2022-05-15 18:16:06.937	PC1\Carlos V	dbo	ALTER_TRIGGER	dbo.tr_prueba	alter trigger tr_prueba on Region for delete as b...	<EVENT_INSTANCE><EventType>ALTER_TRIGGER</EventTyp...
9	9	B	2022-05-15 18:16:18.340	PC1\Carlos V	dbo	DROP_TRIGGER	dbo.tr_prueba	drop trigger tr_prueba	<EVENT_INSTANCE><EventType>DROP_TRIGGER</EventTyp...
10	10	B	2022-05-15 18:18:39.437	PC1\Carlos V	dbo	CREATE_PROCEDURE	dbo.sp_Prueba	create proc sp_Prueba as begin select * from R...	<EVENT_INSTANCE><EventType>CREATE_PROCEDURE</Eve...
11	11	B	2022-05-15 18:19:02.113	PC1\Carlos V	dbo	ALTER_PROCEDURE	dbo.sp_Prueba	alter proc sp_Prueba as begin select * from Cus...	<EVENT_INSTANCE><EventType>ALTER_PROCEDURE</Event...
12	12	B	2022-05-15 18:19:13.133	PC1\Carlos V	dbo	DROP_PROCEDURE	dbo.sp_Prueba	drop proc sp_Prueba	<EVENT_INSTANCE><EventType>DROP_PROCEDURE</Event...

/*5.- Auditar los cambios de las tablas de la base de datos Northwind, grabar en una tabla los campos:

TipoTransaccion: insert, update, delete
Nombre de la Tabla
Campo de la llave primaria
Campo Modificado
Valor Original
Valor Nuevo
Fecha de la transacción
Nombre de Usuario*/

-- Se uso el mismo script del trigger para todos lo pedido, solo usamos el alter y cambiamos el nombre del trigger para cada tabla

use Northwind4

go

```
create table LogTransacciones(  
TipoTrn char(1), -- Insert, Update, Delete  
Tabla varchar(128),  
PK varchar(1000),  
CampoModificado varchar(128),  
ValorOriginal varchar(1000),  
ValorNuevo varchar(1000),  
FechaTrn datetime,  
Usuario varchar(128)  
)
```

go

```
create trigger [tr Problema 5 Region]  
on Region for insert, delete, update  
as  
begin
```

```
    declare @TipoTrn char(1), @Tabla varchar(128), @Usuario varchar(128),  
@FechaTrn datetime  
    declare @ValorNuevo varchar(1000), @ValorViejo varchar(1000), @PK varchar(1000)  
    if(exists(select*from inserted))  
        begin  
            if(exists(select*from deleted))  
                begin  
                    select @TipoTrn = 'U'  
                end  
            else  
                begin  
                    select @TipoTrn = 'I'  
                end  
            end  
        else  
            begin  
                select @TipoTrn = 'D'  
            end  
        select @Tabla = 'Region'  
        select @Usuario = system_user  
        select @FechaTrn = getdate()  
        -- Validar si se cambia el campo nombre  
        if update(RegionDescription) or @TipoTrn = 'D' or @TipoTrn = 'U'  
            begin  
                select @ValorNuevo = convert(varchar(1000), RegionDescription ) from  
inserted  
                select @ValorViejo = convert(varchar(1000), RegionDescription ) from  
deleted
```

```

        if(exists(select*from inserted))
        begin
            select @PK = 'PK = ' + convert(varchar(1000),RegionID) from
inserted
        end
        else
        begin
            select @PK = 'PK = ' + convert(varchar(1000),RegionID) from
deleted
        end

        insert LogTransacciones
        (TipoTrn,Tabla,PK,CampoModificado,ValorOriginal,ValorNuevo,FechaTrn,Usuario)
        values(@TipoTrn,@Tabla,@PK,'RegionDescription
',@ValorViejo,@ValorNuevo,@FechaTrn,@Usuario)
        end
    end
go
-- Products - UnitPrice - Update
update Products set UnitPrice = 12 where ProductID = 2
select * from LogTransacciones
-- Customers - address y Phone - Update
update Customers set Address = 'Hola' where CustomerID = 'ALFKI'
update Customers set Phone = 'Nuevo' where CustomerID = 'ALFKI'
select * from LogTransacciones
-- Region - * - Delete/Insert
insert into Region values(5,'SurEste')
delete Region where RegionID = 5
select * from LogTransacciones

```

	TipoTrn	Tabla	PK	CampoModificado	ValorOriginal	ValorNuevo	FechaTrn	Usuario
1	U	Products	PK = 2	UnitPrice	19.00	12.00	2022-05-15 19:02:42.617	PC1\Carlos V
2	U	Customers	PK = ALFKI	Address	Obere Str. 57	Hola	2022-05-15 19:08:50.690	PC1\Carlos V
3	U	Customers	PK = ALFKI	Phone	030-0074321	Nuevo	2022-05-15 19:10:44.750	PC1\Carlos V
4	I	Region	PK = 5	RegionDescription	NULL	SurEste	2022-05-15 19:15:58.253	PC1\Carlos V
5	D	Region	PK = 5	RegionDescription	SurEste	NULL	2022-05-15 19:16:06.783	PC1\Carlos V