L I S E X
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Testing
Casos de prueba a nivel del modelo

Lisex 0.0

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Resumen

Este documento contiene los casos de prueba a nivel de especificacin obtenidos a partir de LSM0.0. Cada caso est documentado siguiendo la notacin definida en el documento "El proceso de testing". Para esta versin no se cont con el documento que debera contener los conjuntos de prueba (razn por la cual no se identifica el conjunto de prueba al que pertenece cada caso de prueba).

Este documento es una traduccin a la notacin definida en el documento "El proceso de testing.ª partir de documentacin presentada por Martn Degrati y Pablo Garralda la cual describa los casos de prueba pero en una notacin no estadarizada.

Como se indica en el documento "El proceso de testing"se describen primero los casos de prueba de las operaciones que consultan el estado seguidos de aquellos que corresponden a los de las operaciones que modifican el estado.

Los casos de prueba que contiene este documento fueron generados por medio de un anlisis sintctico-funcional efectuado manualmente sobre la especificacin.

Índice general

Parte I

Operaciones de consulta

Capítulo 1

aclstat

1.1. Constantes

Todas las constantes denotan cadenas de caracteres. Es necesario que smbolos que aparecen en la definicin de una constante hayan sido previamente definidos (es decir, se debe haber indicado su tipo).

Todas las constantes son globales con respecto al documento en su totalidad, es decir, se pueden utilizar en todas las operaciones. Al mismo tiempo, no puede haber dos constantes con el mismo identificador.

CONSTANT $u, u_1, u_2, u_3, u_4, root, secofr : SUBJECT$

CONSTANT $p_o, p_{o1}, p_{o2}, p_{o3}, / : OBJNAME$

CONSTANT $OBJECT$

$$\begin{array}{lll} o & ::= & (p_o, File) \\ o_1 & ::= & (p_{o1}, File) \\ o_2 & ::= & (p_{o2}, File) \\ o_3 & ::= & (p_{o3}, File) \\ barra & ::= & (/, Directory) \end{array}$$

CONSTANT $g, g_1, g_2, g_3, AG, RG, SAG : GRPNAME$

CONSTANT $GRPNAME \to (set\ SUBJECT)$

$$G \ ::= \ \{g_1 \mapsto \{u\}, RG \mapsto \{root\}, SAG \mapsto \{secofr\}, AG \mapsto \{u, root, secofr\}\}$$

CONSTANT $SUBJECT \to GRPNAME$

$$PG \ ::= \ \{u \mapsto g_1, root \mapsto RG, secofr \mapsto SAG\}$$

CONSTANT nat

$$\begin{array}{lll} M & ::= & 3 \\ N & ::= & 5 \end{array}$$

CONSTANT $ADMIN, NETWORK, NATO, NUCLEAR : CATEGORY$

CONSTANT $FBI, SECOFR, ROOT, CIA, MENEM : CATEGORY$

CONSTANT $(set\ CATEGORY)$

$$CAT ::= \{NATO, NUCLEAR, FBI\}$$

CONSTANT $SUBJECT * SecClass$

$$\begin{array}{lcl}
rSC & ::= & root \mapsto [level := 0, categs := \{ROOT\}] \\
soSC & ::= & secofr \mapsto [level := 0, categs := \{SECOFR\}] \\
uSC & ::= & u \mapsto [level := N, categs := \{FBI, NATO\}] \\
userSC & ::= & user \mapsto [level := M, categs := \{NATO\}]
\end{array}$$

CONSTANT $(set\ SUBJECT * SecClass)$

$$SSC \ ::= \ \{rSC, soSC, uSC, userSC\}$$

CONSTANT $OBJECT * SecClass$

$$bSC ::= barra \mapsto [level := 0, categs := \emptyset]$$

CONSTANT $(set\ OBJECT * SecClass)$

$$\begin{array}{lcl}
OSC_1 & ::= & \{o_1 \mapsto [level := M, categs := \{FBI, NATO\}], bSC\} \\
OSC & ::= & \{o \mapsto [level := M, categs := \{FBI, NATO\}], bSC\}
\end{array}$$

CONSTANT $AccessCtrlListData$

$$\begin{array}{lcllcl}
acl_o & ::= & [owner & := & u, \\
& & group & := & g_1, \\
& & UserReaders & := & \{u\}, \\
& & GroupReaders & := & \emptyset, \\
& & UserWriters & := & \{u\}, \\
& & GroupWriters & := & \emptyset, \\
& & UserOwners & := & \{u\}, \\
& & GroupOwners & := & \{RG\}] \\
acl_/ & ::= & [owner & := & root, \\
& & group & := & RG, \\
& & UserReaders & := & \{root\}, \\
& & GroupReaders & := & \{AG\}, \\
& & UserWriters & := & \{root\}, \\
& & GroupWriters & := & \emptyset, \\
& & UserOwners & := & \{root\}, \\
& & GroupOwners & := & \{RG\}] \\
acl_1 & ::= & [owner & := & u_1, \\
& & group & := & g_1, \\
& & UserReaders & := & \{u\}, \\
& & GroupReaders & := & \emptyset, \\
& & UserWriters & := & \{u\}, \\
& & GroupWriters & := & \emptyset, \\
& & UserOwners & := & \{u_1\}, \\
& & GroupOwners & := & \{RG\}]
\end{array}$$

CONSTANT $(set\ OBJECT * AccessCtrlListData)$

$$
\begin{array}{lll}
ACL & ::= & \{o \mapsto acl_o, \\
 & & barra \mapsto acl_/\} \\
ACL_1 & ::= & \{o_1 \mapsto acl_o, \\
 & & barra \mapsto acl_/\}
\end{array}
$$

CONSTANT $x : BYTE$

CONSTANT $FILECONT$

$$fc_1 ::= \langle x \rangle$$

CONSTANT $(set\ OBJECT * FILECONT)$

$$
\begin{array}{lll}
F & ::= & \{o \mapsto fc_1\} \\
F_1 & ::= & \{o_1 \mapsto fc_1\}
\end{array}
$$

CONSTANT $(set\ OBJECT * DIRCONT)$

$$
\begin{array}{lll}
D & ::= & \{barra \mapsto \langle o,1 \rangle\} \\
D_1 & ::= & \{barra \mapsto \langle o_1,1 \rangle\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina

1.2. Casos de prueba

Nota 1 *No hay casos de prueba por la negativa.*

OPERATION aclstat

BEGIN TEST CASE 1

COMMENT El solicitante es lector pero no es dueo del objeto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC, \\
acl & := & \{o \mapsto acl_2, barra \mapsto acl_/\}, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante no es lector ni dueo del objeto, pero pertenece a un grupo lector.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC, \\
acl & := & \{o \mapsto acl_2, barra \mapsto acl_/\}, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $barra : OBJECT$

END TEST CASE

END OPERATION

Capítulo 2

oscstat

2.1. Casos de prueba

OPERATION oscstat

BEGIN TEST CASE 1

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := \emptyset], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \emptyset], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N+1+M, categs := \emptyset], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \emptyset], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := CAT], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \emptyset], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N + 1 + M, \\
 & & \qquad categs := CAT], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \emptyset], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 5

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := CAT], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \{A\}], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 6

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto \begin{array}[t]{lll}[level & := & N+1+M, \\ categs & := & CAT],\end{array} \\
 & & \quad rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \{A\}], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 7

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := CAT], \\
 & & \quad rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := CAT], \\
 & & \quad bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 8

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N+1+M, \\
 & & \qquad\qquad categs := CAT], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := CAT], \\
 & & bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 9

COMMENT Propagacin de dominio

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N+1+M, \\
 & & \qquad\qquad categs := CAT], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := CAT], \\
 & & \qquad bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El objeto no existe

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \#9.s.subjectSC, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_1, \\
acl & := & ACL_1, \\
secmat & := & \emptyset, \\
files & := & F_1, \\
directories & := & D_1]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El sujeto no existe

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \#9.s.subjectSC \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El nivel de seguridad del sujeto no supera al del objeto

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{A\}], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto \begin{array}{lll}[level & := & N+1+M, \\ categs & := & \{A\}],\end{array} \\
 & & bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El conjunto de categoras del sujeto no incluye al del objeto

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{A\}], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto [level := N, categs := \{A, B\}], bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 14

COMMENT La clase de seguridad del sujeto no supera a la del objeto

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{A\}], \\
 & & rSC, soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o \mapsto \begin{array}{lll}[level & := & N + 1 + M, \\ categs & := & \{A, B\}],\end{array} \\
 & & bSC\}, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

END OPERATION

Capítulo 3

readdir

Esta operacin no se testea pues no ha sido modificada por el equipo de implementacin.

Capítulo 4

read

Esta operacin no se testea pues no ha sido modificada por el equipo de implementacin.

Capítulo 5

sscstat

5.1. Constantes

CONSTANT $GRPNAME \rightarrow (set\ SUBJECT)$

$$\begin{array}{lll} G_2 & ::= & \{g_1 \mapsto \{u, user\}, \\ & & RG \mapsto \{root\}, \\ & & SAG \mapsto \{secofr\}, \\ & & AG \mapsto \{u, user, root, secofr\}\} \end{array}$$

CONSTANT $SUBJECT \rightarrow GRPNAME$

$$PG_2 \quad ::= \quad \{u \mapsto g_1, user \mapsto g_1, root \mapsto RG, secofr \mapsto SAG\}$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina

5.2. Casos de prueba

OPERATION sscstat

BEGIN TEST CASE 1

> **COMMENT** La clase de acceso del solicitante supera a la del solicitado
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate :=$
>
> $$\begin{array}{lll} [groups & := & G_2, \\ primaryGrp & := & PG_2, \\ subjectSC & := & \begin{array}{lll} \{u & \mapsto & \begin{array}{lll} [level & := & N+1+M, \\ categs & := & \{A,B,C\}], \end{array} \\ user & \mapsto & \begin{array}{lll} [level & := & N, \\ categs & := & \{A,B,C\}], \end{array} \\ rSC, & & \\ soSC\}, & & \end{array} \\ AllGrp & := & AG, \\ RootGrp & := & RG, \\ SecAdmGrp & := & SAG, \\ objectSC & := & OSC_1, \\ acl & := & ACL_1, \\ secmat & := & \emptyset, \\ files & := & F_1, \\ directories & := & D_1] \end{array}$$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $user : SUBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT La clase de acceso del solicitante no supera a la del solicitado

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & \{user \mapsto [level := N + 1 + M, \\
 & & \qquad\qquad categs := \{A, B, C\}], \\
 & & \;\; u \mapsto [level := N, \\
 & & \qquad\qquad categs := \{A, B, C\}], \\
 & & \;\; rSC, \\
 & & \;\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_1, \\
acl & := & ACL_1, \\
secmat & := & \emptyset, \\
files & := & F_1, \\
directories & := & D_1]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $user : SUBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante no existe

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & \{user \mapsto [level := N + 1 + M, \\
 & & \qquad\qquad\quad categs := \{A, B, C\}], \\
 & & \;\; u \qquad \mapsto [level := N, \\
 & & \qquad\qquad\quad categs := \{A, B, C\}], \\
 & & \;\; rSC, \\
 & & \;\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_1, \\
acl & := & ACL_1, \\
secmat & := & \emptyset, \\
files & := & F_1, \\
directories & := & D_1]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $user : SUBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitado no existe

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & \begin{array}{lll}
\{user & \mapsto & \begin{array}{lll} [level & := & N+1+M, \\ categs & := & \{A, B, C\}], \end{array} \\
u & \mapsto & \begin{array}{lll} [level & := & N, \\ categs & := & \{A, B, C\}], \end{array} \\
rSC, & & \\
soSC\}, & &
\end{array} \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_1, \\
acl & := & ACL_1, \\
secmat & := & \emptyset, \\
files & := & F_1, \\
directories & := & D_1]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $u_1 : SUBJECT$

END TEST CASE

END OPERATION

Capítulo 6

stat

Nota 2 *Preguntarle a Martn por varios de los casos de prueba que l entreg.*

6.1. Constantes

CONSTANT $AccessCtrlListData$

$$
\begin{array}{lcllcl}
acl2_o & ::= & [owner & := & u, \\
 & & group & := & g_1, \\
 & & UserReaders & := & \{root\}, \\
 & & GroupReaders & := & \{g_1\}, \\
 & & UserWriters & := & \{u\}, \\
 & & GroupWriters & := & \emptyset, \\
 & & UserOwners & := & \{u\}, \\
 & & GroupOwners & := & \{RG\}]
\end{array}
$$

CONSTANT $(set\ OBJECT * AccessCtrlListData)$

$$
\begin{array}{lcl}
ACL_2 & ::= & \{o \mapsto acl2_o, \\
 & & barra \mapsto acl_/\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina

6.2. Casos de prueba

OPERATION stat

BEGIN TEST CASE 1

> **COMMENT** El usuario es lector del objeto
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate :=$
>
> $$\begin{array}{lll} [groups & := & G, \\ primaryGrp & := & PG, \\ subjectSC & := & \$oscstat\#1.s.subjectSC, \\ AllGrp & := & AG, \\ RootGrp & := & RG, \\ SecAdmGrp & := & SAG, \\ objectSC & := & \$oscsta\#1.s.objectSC, \\ acl & := & ACL, \\ secmat & := & \emptyset, \\ files & := & F, \\ directories & := & D] \end{array}$$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

> **COMMENT** El usuario no es lector del objeto pero pertenece a un grupo que s lo es.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate :=$
>
> $$\begin{array}{lll} [groups & := & G, \\ primaryGrp & := & PG, \\ subjectSC & := & \$oscstat\#1.s.subjectSC, \\ AllGrp & := & AG, \\ RootGrp & := & RG, \\ SecAdmGrp & := & SAG, \\ objectSC & := & \$oscsta\#1.s.objectSC, \\ acl & := & ACL_2, \\ secmat & := & \emptyset, \\ files & := & F, \\ directories & := & D] \end{array}$$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El usuario no es lector del objeto, pero es usuario del sistema.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \$oscstat\#1.s.subjectSC, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \$oscsta\#1.s.objectSC, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $secofr : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El objeto no existe

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G, \\
primaryGrp & := & PG, \\
subjectSC & := & \$oscstat\#1.s.subjectSC, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \$oscsta\#1.s.objectSC, \\
acl & := & ACL, \\
secmat & := & \emptyset, \\
files & := & F, \\
directories & := & D]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_1 : OBJECT$

END TEST CASE

END OPERATION

Parte II

Operaciones de modificacin

Capítulo 7

addUsrGrpToAcl

7.1. Constantes

CONSTANT $ru, wu, pu : SUBJECT$

CONSTANT $rg, wg, pg : GRPNAME$

CONSTANT $GRPNAME \rightarrow (set\ SUBJECT)$

$$
\begin{array}{lll}
G_3 & ::= & \{g \mapsto \{u\}, \\
 & & g_1 \mapsto \{u_1\}, \\
 & & g_2 \mapsto \{u_2\}, \\
 & & g_3 \mapsto \{u_3\}, \\
 & & RG \mapsto \{root\}, \\
 & & SAG \mapsto \{secofr\}, \\
 & & AG \mapsto \{u, u_1, u_2, u_3, root, secofr\}\}
\end{array}
$$

CONSTANT $SUBJECT \rightarrow GRPNAME$

$$
\begin{array}{lll}
PG_3 & ::= & \{u \mapsto g, \\
 & & u_1 \mapsto g_1, \\
 & & u_2 \mapsto g_2, \\
 & & u_3 \mapsto g_3, \\
 & & root \mapsto RG, \\
 & & secofr \mapsto SAG\}
\end{array}
$$

CONSTANT $(set\ OBJECT * ReadersWriters)$

$$
\begin{array}{lll}
SM_2 & ::= & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\} \\
SM & ::= & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset]\} \\
SM_3 & ::= & \{o \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}
\end{array}
$$

CONSTANT $(set\ OBJECT * SecClass)$

$$
\begin{array}{lll}
OSC_{SM} & ::= & \{o \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & bSC\} \\
OSC_2 & ::= & \{o \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & bSC\} \\
OSC_3 & ::= & \{o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & bSC\}
\end{array}
$$

CONSTANT $OBJECT * AccessCtrlListData$

$$
\begin{array}{llllll}
acl_{o1} & ::= & [owner & := & u_1, \\
 & & group & := & g_1, \\
 & & UserReaders & := & \{u_1\}, \\
 & & GroupReaders & := & \{AG\}, \\
 & & UserWriters & := & \{u\}, \\
 & & GroupWriters & := & \emptyset, \\
 & & UserOwners & := & \{u_1\}, \\
 & & GroupOwners & := & \{RG\}] \\
acl_{o2} & ::= & [owner & := & u_2, \\
 & & group & := & g_2, \\
 & & UserReaders & := & \{u_2\}, \\
 & & GroupReaders & := & \{AG\}, \\
 & & UserWriters & := & \{u_1\}, \\
 & & GroupWriters & := & \emptyset, \\
 & & UserOwners & := & \{u_2\}, \\
 & & GroupOwners & := & \{RG\}] \\
acl_{o3} & ::= & [owner & := & u_3, \\
 & & group & := & g_3, \\
 & & UserReaders & := & \{u_1\}, \\
 & & GroupReaders & := & \{AG\}, \\
 & & UserWriters & := & \{u\}, \\
 & & GroupWriters & := & \{AG\}, \\
 & & UserOwners & := & \{u_3\}, \\
 & & GroupOwners & := & \{RG\}]
\end{array}
$$

CONSTANT $(set\ SUBJECT * SecClass)$

$$
\begin{array}{lll}
SSC_2 & ::= & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], rSC, soSC\}
\end{array}
$$

CONSTANT $(set\ OBJECT * FILECONT)$

$$
\begin{array}{lll}
F_2 & ::= & \{o \mapsto fc_1, \\
 & & o_1 \mapsto fc_1, \\
 & & o_2 \mapsto fc_1, \\
 & & o_3 \mapsto fc_1, \} \\
F_3 & ::= & \{o_1 \mapsto fc_1, \\
 & & o_2 \mapsto fc_1, \\
 & & o_3 \mapsto fc_1, \}
\end{array}
$$

CONSTANT $(set\ OBJECT * DIRCONT)$

$$
\begin{array}{lll}
D_2 & ::= & \{barra \mapsto \langle o,1, o_1,1, o_2,1, o_3,1\rangle\} \\
D_3 & ::= & \{barra \mapsto \langle o_1,1, o_2,1, o_3,1\rangle\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente. Se intent incluir un caso por pgina.

7.2. Casos de prueba

OPERATION addUsrGrpToAcl

BEGIN TEST CASE 1

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante no es dueo UNIX del objeto pero es dueo, el objeto no est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante no es dueo UNIX del objeto ni es dueo pero pertenece a un grupo dueo, el objeto no est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante no es dueo del objeto, el objeto no est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_1, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u_1, u_2\}, \\
 & & \quad GroupOwners := \{RG, g_1\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante es dueo del objeto pero el objeto est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1, u_2\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_3, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El objeto no existe, el campo acl es vaco (esta ltima condicin no es posible de satisfacer debido a que en un sistema de archivos real debe haber al menos un directorio).

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{bOS\}, \\
acl & := & \{barra \mapsto acl_/\}, \\
secmat & := & \emptyset, \\
files & := & \emptyset, \\
directories & := & \{barra \mapsto \langle\rangle]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El objeto no existe pero hay otros objetos significativos. La idea es que en el caso anterior se prueba con el sistema de archivos "vaco"y en este existen otros objetos semejantes al solicitado.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_3, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, UserReaders no est vaco.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, ru est en UserReaders.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{ru\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, ru est en UserReaders junto a otros usuarios.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{ru, u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, GroupReaders no est vaco.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g_1, g_2\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, rg est en GroupReaders.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \begin{array}{ll} \{o \mapsto & \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{rg\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\ o_1 \mapsto acl_{o1}, & \\ o_2 \mapsto acl_{o2}, & \\ o_3 \mapsto acl_{o3}, & \\ barra \mapsto acl_{/}\}, & \end{array} \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, rg est en GroupReaders junto a otros grupos.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \begin{array}{ll} \{o \mapsto & \begin{array}{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{rg, g_1, g_2\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\ o_1 \mapsto acl_{o1}, & \\ o_2 \mapsto acl_{o2}, & \\ o_3 \mapsto acl_{o3}, & \\ barra \mapsto acl_{/}\}, & \end{array} \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 14

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, UserWriters no est vaco.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{u_1, u_2\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, wu est en UserWriters.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{wu\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 16

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, wu est en UserWriters junto a otros usuarios.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll}
[owner & := & u_1, \\
group & := & g_1, \\
UserReaders & := & \emptyset, \\
GroupReaders & := & \emptyset, \\
UserWriters & := & \{wu, u_1, u_2\}, \\
GroupWriters & := & \emptyset, \\
UserOwners & := & \{u_1, u_2\}, \\
GroupOwners & := & \{RG, g_1, g\}],
\end{array} \\
& & \;o_1 \mapsto acl_{o1}, \\
& & \;o_2 \mapsto acl_{o2}, \\
& & \;o_3 \mapsto acl_{o3}, \\
& & \;barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 17

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, GroupWriters no est vaco.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_1, g_2\}, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 18

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, wg est en GroupWriters.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{wg\}, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
& & \quad o_1 \mapsto acl_{o1}, \\
& & \quad o_2 \mapsto acl_{o2}, \\
& & \quad o_3 \mapsto acl_{o3}, \\
& & \quad barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 19

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, wg est en GroupWriters junto a otros grupos.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{wg, g_1, g_2\}, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 20

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, pu est en UserOwners.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{pu, u_1, u_2\}, \\ GroupOwners & := & \{RG, g_1, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 21

COMMENT El solicitante est en un grupo dueo, el objeto no est abierto, pg est en GropuOwners junto a otros grupos.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u_2\}, \\ GroupOwners & := & \{RG, pg, g\}], \end{array} \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

END OPERATION

Capítulo 8

chmod

8.1. Constantes

CONSTANT *RIGHTS*

$$\begin{array}{lll} ff & ::= & [read_right := false, write_right := false] \\ rf & ::= & [read_right := true, write_right := false] \\ rw & ::= & [read_right := true, write_right := true] \\ fw & ::= & [read_right := false, write_right := true] \end{array}$$

CONSTANT *PERMS*

Slo se consideran las configuraciones ms habituales; podran considerarse todas las configuraciones posibles y generar un caso para cada una.

$$\begin{array}{lll} perms_1 & ::= & [ownerp := rf, groupp := ff, otherp := ff] \\ perms_2 & ::= & [ownerp := rw, groupp := ff, otherp := ff] \\ perms_3 & ::= & [ownerp := rw, groupp := rf, otherp := ff] \\ perms_4 & ::= & [ownerp := rw, groupp := rw, otherp := ff] \\ perms_5 & ::= & [ownerp := rw, groupp := rw, otherp := rf] \\ perms_6 & ::= & [ownerp := rw, groupp := rw, otherp := rw] \end{array}$$

Casos de prueba a partir de la pgina siguiente. Se intent incluir un caso por pgina.

8.2. Casos de prueba

OPERATION chmod

BEGIN TEST CASE 1

COMMENT El objeto no existe, el campo acl es vaco (esta ltima condicin no es posible de satisfacer debido a que en un sistema de archivos real debe haber al menos un directorio).

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{bOS\}, \\
acl & := & \{barra \mapsto acl_/\}, \\
secmat & := & \emptyset, \\
files & := & \emptyset, \\
directories & := & \{barra \mapsto \langle\rangle\}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El objeto no existe pero hay otros objetos significativos. La idea es que en el caso anterior se prueba con el sistema de archivos "vaco"y en este existen otros objetos semejantes al solicitado.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_3, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $secadm, u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#9.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#9.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#9.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#9.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 14

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#9.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g_2, g_3\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 16

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#15.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 17

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#15.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 18

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#15.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 19

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#15.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 20

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#15.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 21

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g_1\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 22

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#21.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 23

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#21.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 24

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#21.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 25

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#21.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 26

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#21.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 27

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{AG\}, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 28

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#27.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 29

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#27.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 30

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#27.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 31

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#27.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 32

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#27.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 33

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{u_1, u_2\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 34

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#33.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 35

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#33.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 36

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#33.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 37

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#33.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 38

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#33.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 39

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 40

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#39.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 41

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#39.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 42

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#39.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 43

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#39.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 44

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#39.s$
>
> **PARAMETER** $u : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 45

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{g_2, g_3\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 46

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#45.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 47

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#45.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 48

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#45.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 49

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#45.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 50

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#45.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 51

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_1\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 52

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#51.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 53

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#51.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 54

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#51.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 55

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#51.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 56

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#51.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 57

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & |emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_/\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 58

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#57.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 59

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#57.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 60

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#57.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 61

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#57.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 62

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#57.s$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 63

COMMENT Los casos 62 a 121 inclusive son idnticos a los casos 3 a 61 excepto que el solicitante es dueo pero no dueo UNIX. Sin embargo, el campo COMMENT de cada uno de estos casos es el mismo que el del caso correspondiente.

El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u, u_1\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 64

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#63.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 65

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#63.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 66

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#63.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 67

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#63.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 68

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#63.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 69

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 70

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#69.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 71

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#69.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 72

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#69.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 73

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#69.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 74

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#69.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 75

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g_2, g_3\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 76

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#75.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 77

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#75.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 78

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#75.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 79

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#75.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 80

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#75.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 81

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{g_1\}, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u, u_1\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 82

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#81.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 83

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#81.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 84

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#81.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 85

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#81.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 86

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#81.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 87

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{AG\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 88

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#87.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 89

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#87.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 90

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#87.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 91

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#87.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 92

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#87.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 93

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u_1, u_2\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u, u_1\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 94

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#93.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 95

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#93.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 96

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#93.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 97

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#93.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 98

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#93.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 99

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{u\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 100

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#99.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 101

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#99.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 102

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#99.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 103

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#99.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 104

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#99.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 105

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_2, g_3\}, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 106

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#105.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 107

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#105.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 108

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#105.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 109

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#105.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 110

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#105.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 111

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \begin{array}{ll} \{o \mapsto & \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_1\}, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\ o_1 \mapsto acl_{o1}, & \\ o_2 \mapsto acl_{o2}, & \\ o_3 \mapsto acl_{o3}, & \\ barra \mapsto acl_{/}\}, & \end{array} \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 112

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#111.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 113

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#111.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 114

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#111.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 115

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#111.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 116

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#111.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 117

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & |emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_/\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 118

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#117.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 119

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#117.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 120

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#117.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 121

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#117.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 122

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#117.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 123

COMMENT Los casos 122 a 181 inclusive son idnticos a los casos 3 a 61 excepto que el solicitante pertenece a un grupo dueo pero no es dueo UNIX, ni usuario dueo. Sin embargo, el campo COMMENT de cada uno de estos casos es el mismo que el del caso correspondiente.

El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG, g_1\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_/\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 124

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#123.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 125

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#123.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 126

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#123.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 127

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#123.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 128

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserReaders es no vaco, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#123.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 129

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG, g_1\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 130

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#129.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 131

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#129.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 132

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#129.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 133

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#129.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 134

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico lector, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#129.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 135

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g_2, g_3\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 136

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#135.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 137

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#135.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 138

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#135.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 139

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#135.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 140

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#135.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 141

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{g_1\}, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG, g_1\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 142

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#141.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 143

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#141.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 144

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#141.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 145

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#141.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 146

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#141.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 147

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{AG\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 148

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#147.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 149

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#147.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 150

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#147.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 151

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#147.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 152

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupReaders, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#147.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 153

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{u_1, u_2\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 154

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#153.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 155

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#153.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 156

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#153.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 157

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#153.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 158

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, UserWriters es no vaco, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#153.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 159

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG, g_1\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 160

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#159.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 161

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#159.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 162

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#159.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 163

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#159.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 164

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, el solicitante es el nico escritor, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#159.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 165

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_2, g_3\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 166

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#165.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 167

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#165.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 168

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#165.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 169

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#165.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 170

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX no est en GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#165.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 171

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g_1\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 172

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#171.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 173

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#171.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 174

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#171.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 175

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#171.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 176

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo UNIX es el nico elemento de GroupWriters, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#171.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 177

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & |emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG, g_1\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_1$

END TEST CASE

BEGIN TEST CASE 178

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#177.s$

PARAMETER $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_2$

END TEST CASE

BEGIN TEST CASE 179

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_3$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#177.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_3$

END TEST CASE

BEGIN TEST CASE 180

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_4$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#177.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_4$

END TEST CASE

BEGIN TEST CASE 181

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_5$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#177.s$
>
> **PARAMETER** $u_1 : SUBJECT$
>
> **PARAMETER** $o : OBJECT$
>
> **PARAMETER** $perms : PERMS := perms_5$

END TEST CASE

BEGIN TEST CASE 182

> **COMMENT** El solicitante es dueo UNIX del objeto, el objeto no est abierto, AllGrp es el nico elemento de GroupWriters, $perms_6$.
>
> **BELONGS TO**
>
> **STATE PARAMETER** $s : SFSstate := \#177.s$
>
> **PARAMETER** $u_1 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $perms : PERMS := perms_6$

END TEST CASE

BEGIN TEST CASE 183

COMMENT Se podran repetir todos los casos anteriores reemplazando u por $root$ y $secofr$.

END TEST CASE

BEGIN TEST CASE 184

COMMENT Se podran repetir todos los casos anteriores reemplazando u por $root$ y $secofr$.

END TEST CASE

END OPERATION

Capítulo 9

chown

A partir de la pgina siguiente se detallan los casos de prueba a razn de uno por pgina.

9.1. Casos de prueba

OPERATION chown

BEGIN TEST CASE 1

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
& & \;\; o_1 \mapsto acl_{o1}, \\
& & \;\; o_2 \mapsto acl_{o2}, \\
& & \;\; o_3 \mapsto acl_{o3}, \\
& & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante es dueo UNIX del objeto, el objeto no est abierto, el grupo cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante no es dueo UNIX pero es dueo del objeto, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_1, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u, u_1\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante no es dueo UNIX pero es dueo del objeto, el objeto no est abierto, el grupo cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
& & \;\; o_1 \mapsto acl_{o1}, \\
& & \;\; o_2 \mapsto acl_{o2}, \\
& & \;\; o_3 \mapsto acl_{o3}, \\
& & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante no es dueo UNIX del objeto, no es dueo pero pertenece a un grupo dueo, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El solicitante no es dueo UNIX del objetono es dueo pero pertenece a un grupo dueo, el objeto no est abierto, el grupo cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El solicitante es root (que no es dueo UNIX ni dueo del objeto), el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $root : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El solicitante es root (que no es dueo UNIX ni dueo del objeto), el objeto no est abierto, el grupo cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $root : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El solicitante no est autorizado a ejecutar la llamada, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_2 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante no est autorizado a ejecutar la llamada, el objeto no est abierto, el grupo cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_2 : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante es dueo UNIX del objeto, el objeto est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1\} \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_3, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante es dueo del objeto, el objeto est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \begin{array}{l}\{o \mapsto \begin{array}{lll}[owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{u_1\} \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u, u_1\}, \\ GroupOwners & := & \{RG\}],\end{array} \\ o_1 \mapsto acl_{o1}, \\ o_2 \mapsto acl_{o2}, \\ o_3 \mapsto acl_{o3}, \\ barra \mapsto acl_{/}\},\end{array} \\
secmat & := & SM_3, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante pertenece a un grupo dueo del objeto, el objeto est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{u_1\} \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_/\}, \\
secmat & := & SM_3, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 14

COMMENT El objeto no existe, el campo acl es vaco (esta ltima condicin no es posible de satisfacer debido a que en un sistema de archivos real debe haber al menos un directorio).

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{bOS\}, \\
acl & := & \{barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & \emptyset, \\
directories & := & \{barra \mapsto \langle\rangle\}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El objeto no existe pero hay otros objetos significativos. La idea es que en el caso anterior se prueba con el sistema de archivos "vaco"y en este existen otros objetos semejantes al solicitado.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{bOS\}, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 16

COMMENT El solicitante es dueo UNIX y lector del objeto, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u, u_1\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 17

COMMENT El solicitante es dueo UNIX, el objeto no est abierto, el grupo es lector y cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g, g_1\}, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 18

COMMENT El solicitante es dueo UNIX y escritor del objeto, el objeto no est abierto, el grupo no cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \{u, u_1\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
& & \;\; o_1 \mapsto acl_{o1}, \\
& & \;\; o_2 \mapsto acl_{o2}, \\
& & \;\; o_3 \mapsto acl_{o3}, \\
& & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_1 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 19

COMMENT El solicitante es dueo UNIX, el objeto no est abierto, el grupo es escritor y cambia.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lcl} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{g, g_1\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $u_3 : SUBJECT$

PARAMETER $g_2 : GRPNAME$

END TEST CASE

BEGIN TEST CASE 20

COMMENT A partir de los casos 19, 18, 17, y 16 podran generarse 12 nuevos casos cambiando la ACL de *o* de manera tal que el solicitante sea dueo (no UNIX), pertenezca a un grupo dueo y finalmente sea *root*.

De manera semejante se podran generar nuevos casos si se pide que el dueo y el grupo sean lectores y escritores simultaneamente (por s solos o a la vez) y a la vez combinarlos con las combinaciones mencionadas en el parrafo anterior.

Es de esperar que una herramienta automtica genere estos casos sugeridos.

END TEST CASE

END OPERATION

Capítulo 10

chsubsc

10.1. Constantes

CONSTANT $SecClass$

$$sc \ := \ [level := M, categs := \{FBI, NATO, CIA, MENEM\}]$$

CONSTANT $ACL_2 : (set\ OBJECT * AccessCtrlListData)$

$$\begin{array}{l}\{o \mapsto acl_o,\\ o_1 \mapsto acl_{o1},\\ o_2 \mapsto acl_{o2},\\ o_3 \mapsto acl_{o3},\\ barra \mapsto acl_/\}\end{array}$$

CONSTANT $GRPNAME \to (set\ SUBJECT)$

$$\begin{array}{lcl} G_4 & := & \{g \mapsto \{u\},\\ & & g_1 \mapsto \{u_1\},\\ & & g_2 \mapsto \{u_2\},\\ & & g_3 \mapsto \{u_3\},\\ & & RG \mapsto \{root\},\\ & & SAG \mapsto \{secofr, u_3\},\\ & & AG \mapsto \{u, u_1, u_2, u_3, root, secofr\}\}\end{array}$$

CONSTANT $(set\ OBJECT * ReadersWriters)$

$$\begin{array}{lcl} SM_4 & := & \{o_1 \mapsto [ActReaders := \{u\}, ActWriters := \emptyset],\\ & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}],\\ & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}\\ SM_5 & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset],\\ & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u, u_1\}],\\ & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}\end{array}$$

A partir de la pgina siguiente se detallan los casos de prueba a razn de uno por pgina.

10.2. Casos de prueba

OPERATION chsubsc

BEGIN TEST CASE 1

COMMENT Hay objetos abiertos pero u no tiene ninguno abierto, el solicitante es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $secofr : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 2

COMMENT Hay objetos abiertos pero u no tiene ninguno abierto, el solicitante no pertenece a $SecAdmGrp$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_1 : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 3

COMMENT Hay objetos abiertos y u es lector de uno de ellos, el solicitante es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_4, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $secofr : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 4

COMMENT Hay objetos abiertos y u es escritor de uno de ellos, el solicitante es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_5, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $secofr : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El usuario no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lcl} [groups & := & G_4, \\ primaryGrp & := & PG_3, \\ subjectSC & := & SSC_2, \\ AllGrp & := & AG, \\ RootGrp & := & RG, \\ SecAdmGrp & := & SAG, \\ objectSC & := & OSC_2, \\ acl & := & ACL_2, \\ secmat & := & SM_5, \\ files & := & F_2, \\ directories & := & D_2] \end{array}$$

PARAMETER $secofr : SUBJECT$

PARAMETER $u_{ne} : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 6

COMMENT Hay objetos abiertos pero u no tiene ninguno abierto, el solicitante pertenece a $SecAdmGrp$, el solicitante no es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lcl}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}$$

PARAMETER $u_3 : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 7

COMMENT Hay objetos abiertos y u es lector de uno de ellos, el solicitante pertenece a $SecAdmGrp$, el solicitante no es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_4, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_3 : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

BEGIN TEST CASE 8

COMMENT Hay objetos abiertos y u es escritor de uno de ellos, el solicitante pertenece a $SecAdmGrp$, el solicitante no es $secofr$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_4, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_5, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_3 : SUBJECT$

PARAMETER $u : SUBJECT$

PARAMETER $sc : SecClass$

END TEST CASE

END OPERATION

Capítulo 11

close

Esta operacin no se testea pues no ha sido modificada por el equipo de implementacin.

Capítulo 12

create

12.1. Constantes

CONSTANT $p, p_1 : OBJNAME$

A partir de la pgina siguiente se detallan los casos de prueba a razn de uno por pgina.

12.2. Casos de prueba

Se intenta testear slo la funcionalidad estrctamente relacionada con el nuevo modelo de seguridad. Por lo tanto, no se testearn cosas tales como:

— Creacin de archivos en caminos de directorios ”profundos”

— Creacin de distintos tipos de archivos

OPERATION create

BEGIN TEST CASE 1

COMMENT El directorio-padre de p existe pero no hay ningn objeto abierto (en particular el padre de p).

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lcl} [groups & := & G_3, \\ primaryGrp & := & PG_3, \\ subjectSC & := & SSC_2, \\ AllGrp & := & AG, \\ RootGrp & := & RG, \\ SecAdmGrp & := & SAG, \\ objectSC & := & OSC_2, \\ acl & := & ACL_2, \\ secmat & := & \emptyset, \\ files & := & F_2, \\ directories & := & D_2] \end{array}$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El directorio-padre de p existe pero no est abierto para escritura.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_1$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
& & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
& & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
& & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_2$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_2 : PERMS$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_3$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_3 : PERMS$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_4$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_4 : PERMS$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_5$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_5 : PERMS$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El directorio-padre de p existe y est abierto para escritura por el solicitante, $perms_6$.

BELONGS TO

STATE PARAMETER $s : SFSstate := \#3.s$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_6 : PERMS$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El directorio-padre de p existe y est abierto para escritura pero no por el solicitante.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \begin{array}{lll} \{o_1 & \mapsto & [ActReaders := \{u_1\}, ActWriters := \emptyset], \\ o_2 & \mapsto & [ActReaders := \emptyset, ActWriters := \{u_1\}], \\ o_3 & \mapsto & [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\ barra & \mapsto & \begin{array}{lll} [ActReaders & := & \{u_1, u_2\}, \\ ActWriters & := & \{u_1, u_2\}]\}, \end{array} \end{array} \\
files & := & F_2, \\
directories & := & D_2]
\end{array}$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El archivo ya existe como archivo.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \emptyset, \\
files & := & \{o \mapsto fc_1, \\
 & & o_1 \mapsto fc_1, \\
 & & o_2 \mapsto fc_1, \\
 & & o_3 \mapsto fc_1, \\
 & & (p, File) \mapsto fc_1\}, \\
directories & := & \{barra \mapsto \langle o,1, o_1,1, o_2,1, o_3,1, p\rangle\} \\
]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El archivo ya existe como directorio.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \emptyset, \\
files & := & \{o \mapsto fc_1, \\
 & & o_1 \mapsto fc_1, \\
 & & o_2 \mapsto fc_1, \\
 & & o_3 \mapsto fc_1\}, \\
directories & := & \{barra \mapsto \langle o,1, o_1,1, o_2,1, o_3,1, p\rangle, \\
 & & (p, Directory) \mapsto \langle\rangle\}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El directorio padre de p no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \emptyset, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $p_1 : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \begin{array}{lll} \{o_1 & \mapsto & [ActReaders := \{u_1\}, ActWriters := \emptyset], \\ o_2 & \mapsto & [ActReaders := \emptyset, ActWriters := \{u_1\}], \\ o_3 & \mapsto & [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\ barra & \mapsto & \begin{array}{lll} [ActReaders & := & \{u_1, u_2\}, \\ ActWriters & := & \{u_1, u_2\}]\}, \end{array} \end{array} \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u_{ne} : SUBJECT$

PARAMETER $p : OBJNAME$

PARAMETER $perms_1 : PERMS$

END TEST CASE

END OPERATION

Capítulo 13

delUsrGrpFromAcl

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina.

13.1. Casos de prueba

OPERATION delUsrGrpFromAcl

BEGIN TEST CASE 1

COMMENT El solicitante es dueo UNIX, el objeto no est abierto, no se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante no es dueo UNIX pero es dueo, el objeto no est abierto, no se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante no es dueo pero pertenece a un grupo dueo, el objeto no est abierto, no se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante no es dueo, el objeto no est abierto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g_2\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante es dueo UNIX, el objeto no est abierto, se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \begin{array}{l} \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\ o_1 \mapsto acl_{o1}, \\ o_2 \mapsto acl_{o2}, \\ o_3 \mapsto acl_{o3}, \\ barra \mapsto acl_{/}\}, \end{array} \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $RG, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El solicitante no es dueo UNIX pero es dueo, el objeto no est abierto, se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
& & o_1 \mapsto acl_{o1}, \\
& & o_2 \mapsto acl_{o2}, \\
& & o_3 \mapsto acl_{o3}, \\
& & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $RG, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El solicitante no es dueo pero pertenece a un grupo dueo, el objeto no est abierto, se intenta eliminar *RootGrp*.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, pu : SUBJECT$

PARAMETER $RG, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 8 := @addUsrGrpToAcl#6

END TEST CASE

BEGIN TEST CASE 9 := @addUsrGrpToAcl#7

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante es dueo UNIX, el objeto no est abierto, se elimina el dueo UNIX.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, u : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante no es dueo UNIX pero es dueo, el objeto no est abierto se elimina el dueo UNIX.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, u_1 : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante no es dueo pero pertenece a un grupo dueo, el objeto no est abierto, se elimina el dueo UNIX.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_2, \\
primaryGrp & := & PG_2, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u_1\}, \\ GroupOwners & := & \{RG, g\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & SM_2, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

PARAMETER $ru, wu, u_1 : SUBJECT$

PARAMETER $rg, wg, pg : GRPNAME$

END TEST CASE

END OPERATION

Capítulo 14

mkdir

14.1. Casos de prueba

Los casos de prueba de esta operacin son bsicamente idnticos a los de *create*.

OPERATION mkdir

BEGIN TEST CASE 1 := @create#1

END TEST CASE

BEGIN TEST CASE 2 := @create#2

END TEST CASE

BEGIN TEST CASE 3 := @create#3

END TEST CASE

BEGIN TEST CASE 4 := @create#4

END TEST CASE

BEGIN TEST CASE 5 := @create#5

END TEST CASE

BEGIN TEST CASE 6 := @create#6

END TEST CASE

BEGIN TEST CASE 7 := @create#7

END TEST CASE

BEGIN TEST CASE 8 := @create#8

END TEST CASE

BEGIN TEST CASE 9 := @create#9

END TEST CASE

BEGIN TEST CASE 10 := @create#10

END TEST CASE

BEGIN TEST CASE 11 := @create#11

END TEST CASE

BEGIN TEST CASE 12 := @create#12

END TEST CASE

BEGIN TEST CASE 13 := @create#13

END TEST CASE

END OPERATION

Capítulo 15

open

15.1. Constantes

CONSTANT $p_d, p_f : OBJNAME$

CONSTANT $OBJECT$

$$
\begin{array}{lll}
o_d & ::= & (p_d, Directory) \\
o_f & ::= & (p_f, File)
\end{array}
$$

CONSTANT $(set\ OBJECT * FILECONT)$

$$
\begin{array}{lll}
F_{of} & ::= & \{o_f \mapsto fc_1, \\
 & & o_1 \mapsto fc_1, \\
 & & o_2 \mapsto fc_1, \\
 & & o_3 \mapsto fc_1, \}
\end{array}
$$

CONSTANT $(set\ OBJECT * DIRCONT)$

$$
\begin{array}{lll}
D_{of} & ::= & \{barra \mapsto \langle o_f,1, o_1,1, o_2,1, o_3,1\rangle\} \\
D_{od} & ::= & \{barra \ \mapsto \ \langle o_d,1, o_1,1, o_2,1, o_3,1\rangle, \\
 & & \ o_d \qquad \mapsto \ \langle\rangle\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina.

15.2. Casos de prueba

OPERATION open

BEGIN TEST CASE 1

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; R, D.

De aqu en ms: R es abreviatura de $READ$, W es abreviatura de $WRITE$, D es abreviatura de $DIRECTORY$, F es abreviatura de $FILE$. Por s solas cualquiera de estas letras indican el modo en que se ha solicitado la apertura del archivo y qu tipo de archivo es, por ejemplo "R, D"significa *open* de un directorio en modo de lectura.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & \phantom{\{}o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}bSC\;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \{u\}, \\
 & & \qquad GroupWriters := \emptyset, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \phantom{\{}o_1 \mapsto acl_{o1}, \\
 & & \phantom{\{}o_2 \mapsto acl_{o2}, \\
 & & \phantom{\{}o_3 \mapsto acl_{o3}, \\
 & & \phantom{\{}barra \mapsto acl_{/}\}, \\
secmat & := & \{o_d \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & \phantom{\{}o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$
PARAMETER $o_d : OBJECT$
PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, tiene otro objeto mayor que o abierto en W; R, D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_d \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; R, D; pertenece a grupo lector.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;\; , \;\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; bSC \;\; \} \;\; , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g\}, \\
 & & \qquad UserWriters := \{u\}, \\
 & & \qquad GroupWriters := \emptyset, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_d \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & \;\; o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, tiene otro objeto mayor que o abierto en W; R, D; pertenece a un grupo lector.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \quad , \quad soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & bSC \quad \} \quad , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{g\}, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_d \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; R, F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := M, categs := \{FBI\}], \\
 & & \phantom{\{}o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \{u\}, \\
 & & \qquad GroupWriters := \emptyset, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \phantom{\{}o_1 \mapsto acl_{o1}, \\
 & & \phantom{\{}o_2 \mapsto acl_{o2}, \\
 & & \phantom{\{}o_3 \mapsto acl_{o3}, \\
 & & \phantom{\{}barra \mapsto acl_{/}\}, \\
secmat & := & \{o_f \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & \phantom{\{}o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, tiene otro objeto mayor que o abierto en W; R, F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := M, categs := \{FBI\}], \\
 & & \;o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;bSC\;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & \;o_1 \mapsto acl_{o1}, \\
 & & \;o_2 \mapsto acl_{o2}, \\
 & & \;o_3 \mapsto acl_{o3}, \\
 & & \;barra \mapsto acl_{/}\}, \\
secmat & := & \{o_f \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & \;o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; R, F; pertenece a grupo lector.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; bSC\;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g\}, \\
 & & \qquad UserWriters := \{u\}, \\
 & & \qquad GroupWriters := \emptyset, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_f \mapsto [ActReaders := \emptyset, ActWriters := \{u\}], \\
 & & \;\; o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, tiene otro objeto mayor que o abierto en W; R, F; pertenece a un grupo lector.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \begin{array}{lcl} \{u & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ u_1 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ u_2 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ u_3 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ rSC & , & soSC\}, \end{array} \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \begin{array}{lcl} \{o_f & \mapsto & [level := M, categs := \{FBI\}], \\ o_1 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ o_2 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ o_3 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ bSC & \} & , \end{array} \\
acl & := & \begin{array}{lcl} \{o_f & \mapsto & \begin{array}{lcl} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \emptyset, \\ GroupReaders & := & \{g\}, \\ UserWriters & := & \{u\}, \\ GroupWriters & := & \emptyset, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\ o_1 & \mapsto & acl_{o1}, \\ o_2 & \mapsto & acl_{o2}, \\ o_3 & \mapsto & acl_{o3}, \\ barra & \mapsto & acl_{/}\}, \end{array} \\
secmat & := & \begin{array}{lcl} \{o_f & \mapsto & [ActReaders := \emptyset, ActWriters := \{u\}], \\ o_3 & \mapsto & [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}]\}, \end{array} \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; W, D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & \ o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante puede abrir el objeto, el objeto ya est abierto por otros usuarios, el solicitante tiene abierto otro objeto en modo R; W, D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & bSC \;\} \;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{AG\}, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}], \\
 & & o_d \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & o_2 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en R, no tiene otros objetos abiertos; W, D; pertenece a grupo escritor.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g\}, \\
 & & \qquad UserWriters := \{u\}, \\
 & & \qquad GroupWriters := \{g\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_d \mapsto [ActReaders := \{u\}, ActWriters := \emptyset], \\
 & & \quad o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante puede abrir el objeto, el objeto ya est abierto por otros usuarios, el solicitante tiene abierto otro objeto en modo R; el solicitante pertenece a grupo escritor; W, D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{AG\}, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}], \\
 & & \quad o_d \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & \quad o_2 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en W, no tiene otros objetos abiertos; W, F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[\mathit{groups} & := & G_3, \\
\mathit{primaryGrp} & := & PG_3, \\
\mathit{subjectSC} & := & \{u \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ u_1 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ u_2 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ u_3 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ rSC \ , \ soSC\}, \\
\mathit{AllGrp} & := & AG, \\
\mathit{RootGrp} & := & RG, \\
\mathit{SecAdmGrp} & := & SAG, \\
\mathit{objectSC} & := & \{o_f \mapsto [\mathit{level} := M, \mathit{categs} := \{FBI\}], \\
 & & \ \ o_1 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ o_2 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ o_3 \mapsto [\mathit{level} := N, \mathit{categs} := \{FBI, NATO\}], \\
 & & \ \ bSC \ \} \ , \\
\mathit{acl} & := & \{o_f \mapsto [\mathit{owner} := u, \\
 & & \qquad\quad \mathit{group} := g_1, \\
 & & \qquad\quad \mathit{UserReaders} := \emptyset, \\
 & & \qquad\quad \mathit{GroupReaders} := \emptyset, \\
 & & \qquad\quad \mathit{UserWriters} := \{u\}, \\
 & & \qquad\quad \mathit{GroupWriters} := \emptyset, \\
 & & \qquad\quad \mathit{UserOwners} := \{u\}, \\
 & & \qquad\quad \mathit{GroupOwners} := \{RG\}], \\
 & & \ \ o_1 \mapsto acl_{o1}, \\
 & & \ \ o_2 \mapsto acl_{o2}, \\
 & & \ \ o_3 \mapsto acl_{o3}, \\
 & & \ \ \mathit{barra} \mapsto acl_{/}\}, \\
\mathit{secmat} & := & \{o_3 \mapsto [\mathit{ActReaders} := \{u_1\}, \mathit{ActWriters} := \{u_1\}]\}, \\
\mathit{files} & := & F_{of}, \\
\mathit{directories} & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 14

COMMENT El solicitante puede abrir el objeto, el objeto ya est abierto por otros usuarios, el solicitante tiene abierto otro objeto en modo R; W, F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;bSC\;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{AG\}, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & \;o_1 \mapsto acl_{o1}, \\
 & & \;o_2 \mapsto acl_{o2}, \\
 & & \;o_3 \mapsto acl_{o3}, \\
 & & \;barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}], \\
 & & \;o_f \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & \;o_2 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El solicitante puede abrir el objeto, lo tiene abierto en R, no tiene otros objetos abiertos; W, F; pertenece a grupo escritor.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := M, categs := \{FBI\}], \\
 & & \;o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;o_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;bSC\;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \{g\}, \\
 & & \quad UserWriters := \{u\}, \\
 & & \quad GroupWriters := \{g\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & \;o_1 \mapsto acl_{o1}, \\
 & & \;o_2 \mapsto acl_{o2}, \\
 & & \;o_3 \mapsto acl_{o3}, \\
 & & \;barra \mapsto acl_{/}\}, \\
secmat & := & \{o_f \mapsto [ActReaders := \{u\}, ActWriters := \emptyset], \\
 & & \;o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 16

COMMENT El solicitante puede abrir el objeto, el objeto ya est abierto por otros usuarios, el solicitante tiene abierto otro objeto en modo R; el solicitante pertenece a grupo escritor; W, F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}rSC \quad , \quad soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \phantom{\{}bSC \quad \} \quad , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{AG\}, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \phantom{\{}o_1 \mapsto acl_{o1}, \\
 & & \phantom{\{}o_2 \mapsto acl_{o2}, \\
 & & \phantom{\{}o_3 \mapsto acl_{o3}, \\
 & & \phantom{\{}barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u, u_1\}], \\
 & & \phantom{\{}o_f \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & \phantom{\{}o_2 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}]\}, \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 17

COMMENT El objeto no existe, el solicitante existe; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_3, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 18

COMMENT El solicitante no tiene permiso DAC para R; tiene permiso MAC; hay grupos en $GroupReaders$; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \ bSC\ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g_2\}, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 19

COMMENT El solicitante no tiene permiso DAC para R; tiene permiso MAC; no hay grupos en $GroupReaders$; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 20

COMMENT El solicitante no existe, el objeto existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_3, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}
$$

PARAMETER $u_{ne} : SUBJECT$

PARAMETER $o_1 : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 21

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, menor nivel; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := M, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC\;\}\;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 22

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, categoras no incluyen; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \;\} \;, \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 23

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, conjuntos incomparables, algo en comn; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, CIA\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 24

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, conjuntos incomparables, nada en comn; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{ADMIN, CIA\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 25

COMMENT El solicitante no tiene permiso DAC para W; tiene permiso MAC; hay grupos en $GroupWriters$; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_3 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}rSC \quad , \quad soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_3 \quad \mapsto \quad [level := M, categs := \{FBI\}], \\
 & & \phantom{\{}bSC \quad \} \quad , \\
acl & := & \{o_f \quad \mapsto \quad [owner := u, \\
 & & \qquad\qquad group := g_1, \\
 & & \qquad\qquad UserReaders := \emptyset, \\
 & & \qquad\qquad GroupReaders := \{g_2\}, \\
 & & \qquad\qquad UserWriters := \emptyset, \\
 & & \qquad\qquad GroupWriters := \{g_2\}, \\
 & & \qquad\qquad UserOwners := \{u\}, \\
 & & \qquad\qquad GroupOwners := \{RG\}], \\
 & & \phantom{\{}o_1 \quad \mapsto \quad acl_{o1}, \\
 & & \phantom{\{}o_2 \quad \mapsto \quad acl_{o2}, \\
 & & \phantom{\{}o_3 \quad \mapsto \quad acl_{o3}, \\
 & & \phantom{\{}barra \quad \mapsto \quad acl_{/}\}, \\
secmat & := & \{o_3 \quad \mapsto \quad [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 26

COMMENT El solicitante no tiene permiso DAC para W; tiene permiso MAC; no hay grupos en $GroupWriters$; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \emptyset, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \emptyset, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 27

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, menor nivel; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \;\mapsto\; [level := M, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \;\mapsto\; [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \;\} \;, \\
acl & := & \{o_f \;\mapsto\; [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \;\mapsto\; acl_{o1}, \\
 & & \;\; o_2 \;\mapsto\; acl_{o2}, \\
 & & \;\; o_3 \;\mapsto\; acl_{o3}, \\
 & & \;\; barra \;\mapsto\; acl_{/}\}, \\
secmat & := & \{o_3 \;\mapsto\; [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 28

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, categoras no incluyen; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \begin{array}{lll} \{u & \mapsto & [level := N, categs := \{FBI\}], \\ u_1 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ u_2 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ u_3 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ rSC & , & soSC\}, \end{array} \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \begin{array}{lll} \{o_f & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ o_1 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ o_2 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\ o_3 & \mapsto & [level := M, categs := \{FBI\}], \\ bSC & \} & , \end{array} \\
acl & := & \begin{array}{lll} \{o_f & \mapsto & \begin{array}{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\ o_1 & \mapsto & acl_{o1}, \\ o_2 & \mapsto & acl_{o2}, \\ o_3 & \mapsto & acl_{o3}, \\ barra & \mapsto & acl_{/}\}, \end{array} \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 29

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, conjuntos incomparables, algo en comn; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, CIA\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad\quad group := g_1, \\
 & & \quad\quad UserReaders := \{u\}, \\
 & & \quad\quad GroupReaders := \emptyset, \\
 & & \quad\quad UserWriters := \emptyset, \\
 & & \quad\quad GroupWriters := \{AG\}, \\
 & & \quad\quad UserOwners := \{u\}, \\
 & & \quad\quad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 30

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, conjuntos incomparables, nada en comn; F.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{ADMIN, CIA\}], \\
 & & u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_f \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & bSC \ \} \ , \\
acl & := & \{o_f \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_{of}, \\
directories & := & D_{of}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_f : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 31

COMMENT El objeto no existe, el solicitante existe; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_3, \\
acl & := & \{o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \emptyset, \\
files & := & F_3, \\
directories & := & D_3]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 32

COMMENT El solicitante no tiene permiso DAC para R; tiene permiso MAC; hay grupos en $GroupReaders$; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \ o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \ bSC\ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g_2\}, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \ o_1 \mapsto acl_{o1}, \\
 & & \ o_2 \mapsto acl_{o2}, \\
 & & \ o_3 \mapsto acl_{o3}, \\
 & & \ barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 33

COMMENT El solicitante no tiene permiso DAC para R; tiene permiso MAC; no hay grupos en $GroupReaders$; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC\;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 34

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, menor nivel; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \quad \mapsto \quad [level := M, categs := \{FBI, NATO\}], \\
 & & u_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & u_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & u_3 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & rSC \quad , \quad soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 \quad \mapsto \quad [level := M, categs := \{FBI\}], \\
 & & bSC \quad \} \quad , \\
acl & := & \{o_d \quad \mapsto \quad [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & o_1 \quad \mapsto \quad acl_{o1}, \\
 & & o_2 \quad \mapsto \quad acl_{o2}, \\
 & & o_3 \quad \mapsto \quad acl_{o3}, \\
 & & barra \quad \mapsto \quad acl_{/}\}, \\
secmat & := & \{o_3 \quad \mapsto \quad [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 35

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, categoras no incluyen; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \quad \mapsto \quad [level := N, categs := \{FBI\}], \\
 & & \quad u_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \quad , \quad soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \quad \mapsto \quad [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \quad \mapsto \quad [level := M, categs := \{FBI\}], \\
 & & \quad bSC \quad \} \quad , \\
acl & := & \{o_d \quad \mapsto \quad [owner := u, \\
 & & \qquad\qquad group := g_1, \\
 & & \qquad\qquad UserReaders := \{u\}, \\
 & & \qquad\qquad GroupReaders := \emptyset, \\
 & & \qquad\qquad UserWriters := \emptyset, \\
 & & \qquad\qquad GroupWriters := \{AG\}, \\
 & & \qquad\qquad UserOwners := \{u\}, \\
 & & \qquad\qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \quad \mapsto \quad acl_{o1}, \\
 & & \quad o_2 \quad \mapsto \quad acl_{o2}, \\
 & & \quad o_3 \quad \mapsto \quad acl_{o3}, \\
 & & \quad barra \quad \mapsto \quad acl_{/}\}, \\
secmat & := & \{o_3 \quad \mapsto \quad [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 36

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, conjuntos incomparables, algo en comn; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, CIA\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \; , \; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \; \} \; , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 37

COMMENT El solicitante tiene permiso DAC para R; no tiene permiso MAC, conjuntos incomparables, nada en comn; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{ADMIN, CIA\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $READ : MODE$

END TEST CASE

BEGIN TEST CASE 38

COMMENT El solicitante no tiene permiso DAC para W; tiene permiso MAC; hay grupos en $GroupWriters$; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC\;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \{g_2\}, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{g_2\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 39

COMMENT El solicitante no tiene permiso DAC para W; tiene permiso MAC; no hay grupos en $GroupWriters$; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \emptyset, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \emptyset, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \mapsto acl_{o1}, \\
 & & \;\; o_2 \mapsto acl_{o2}, \\
 & & \;\; o_3 \mapsto acl_{o3}, \\
 & & \;\; barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 40

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, menor nivel; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := M, categs := \{FBI, NATO\}], \\
& & \phantom{\{}u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}rSC \ , \ soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
& & \phantom{\{}o_3 \mapsto [level := M, categs := \{FBI\}], \\
& & \phantom{\{}bSC \ \} \ , \\
acl & := & \{o_d \mapsto [owner := u, \\
& & \phantom{\{o_d \mapsto [}group := g_1, \\
& & \phantom{\{o_d \mapsto [}UserReaders := \{u\}, \\
& & \phantom{\{o_d \mapsto [}GroupReaders := \emptyset, \\
& & \phantom{\{o_d \mapsto [}UserWriters := \emptyset, \\
& & \phantom{\{o_d \mapsto [}GroupWriters := \{AG\}, \\
& & \phantom{\{o_d \mapsto [}UserOwners := \{u\}, \\
& & \phantom{\{o_d \mapsto [}GroupOwners := \{RG\}], \\
& & \phantom{\{}o_1 \mapsto acl_{o1}, \\
& & \phantom{\{}o_2 \mapsto acl_{o2}, \\
& & \phantom{\{}o_3 \mapsto acl_{o3}, \\
& & \phantom{\{}barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 41

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, categoras no incluyen; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{FBI\}], \\
 & & \phantom{\{}u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \phantom{\{}o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \phantom{\{}bSC\;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \phantom{\{}o_1 \mapsto acl_{o1}, \\
 & & \phantom{\{}o_2 \mapsto acl_{o2}, \\
 & & \phantom{\{}o_3 \mapsto acl_{o3}, \\
 & & \phantom{\{}barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 42

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, conjuntos incomparables, algo en comn; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \;\mapsto\; [level := N, categs := \{FBI, CIA\}], \\
 & & \;\; u_1 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_2 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; u_3 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_1 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_2 \;\mapsto\; [level := N, categs := \{FBI, NATO\}], \\
 & & \;\; o_3 \;\mapsto\; [level := M, categs := \{FBI\}], \\
 & & \;\; bSC \;\}\;, \\
acl & := & \{o_d \;\mapsto\; [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \;\; o_1 \;\mapsto\; acl_{o1}, \\
 & & \;\; o_2 \;\mapsto\; acl_{o2}, \\
 & & \;\; o_3 \;\mapsto\; acl_{o3}, \\
 & & \;\; barra \;\mapsto\; acl_{/}\}, \\
secmat & := & \{o_3 \;\mapsto\; [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

BEGIN TEST CASE 43

COMMENT El solicitante tiene permiso DAC para W; no tiene permiso MAC, conjuntos incomparables, nada en comn; D.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & \{u \mapsto [level := N, categs := \{ADMIN, CIA\}], \\
 & & \quad u_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad u_3 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad rSC \;,\; soSC\}, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & \{o_d \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_1 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_2 \mapsto [level := N, categs := \{FBI, NATO\}], \\
 & & \quad o_3 \mapsto [level := M, categs := \{FBI\}], \\
 & & \quad bSC\;\}\;, \\
acl & := & \{o_d \mapsto [owner := u, \\
 & & \qquad group := g_1, \\
 & & \qquad UserReaders := \{u\}, \\
 & & \qquad GroupReaders := \emptyset, \\
 & & \qquad UserWriters := \emptyset, \\
 & & \qquad GroupWriters := \{AG\}, \\
 & & \qquad UserOwners := \{u\}, \\
 & & \qquad GroupOwners := \{RG\}], \\
 & & \quad o_1 \mapsto acl_{o1}, \\
 & & \quad o_2 \mapsto acl_{o2}, \\
 & & \quad o_3 \mapsto acl_{o3}, \\
 & & \quad barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

PARAMETER $WRITE : MODE$

END TEST CASE

END OPERATION

Capítulo 16

owner_close

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina.

16.1. Casos de prueba

OPERATION owner_close

BEGIN TEST CASE 1

COMMENT El solicitante es dueo UNIX del objeto que est abierto en modo $READ$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lcl} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \ \mapsto \ [ActReaders := \{u_1, u_2\}, ActWriters := \emptyset], \\
 & & o_3 \ \mapsto \ [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El solicitante es dueo del objeto que est abierto en modo $READ$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \ \mapsto \ [ActReaders := \{u_1, u_2\}, ActWriters := \emptyset], \\
 & & o_3 \ \mapsto \ [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT El solicitante pertenece a un grupo dueo del objeto que est abierto en modo *READ* por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_2, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u_2\}, \\
 & & \quad GroupOwners := \{RG, g\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_1, u_2\}, ActWriters := \emptyset], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El solicitante es dueo UNIX del objeto que est abierto en modo $WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El solicitante es dueo del objeto que est abierto en modo $WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u_1, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u_1, u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \ \mapsto \ [ActReaders := \{u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \ \mapsto \ [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 6

COMMENT El solicitante pertenece a un grupo dueo del objeto que est abierto en modo $WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_2, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u_2\}, \\
 & & \quad GroupOwners := \{RG, g\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 7

COMMENT El solicitante es dueo UNIX del objeto que est abierto en modo $READ-WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll} [owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \;\mapsto\; [ActReaders := \{u_1, u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \;\mapsto\; [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 8

COMMENT El solicitante es dueo del objeto que est abierto en modo $READ-WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_1, \\
& & \quad group := g_1, \\
& & \quad UserReaders := \{u_1, u_2\}, \\
& & \quad GroupReaders := \emptyset, \\
& & \quad UserWriters := \emptyset, \\
& & \quad GroupWriters := \{AG\}, \\
& & \quad UserOwners := \{u_1, u\}, \\
& & \quad GroupOwners := \{RG\}], \\
& & o_1 \mapsto acl_{o1}, \\
& & o_2 \mapsto acl_{o2}, \\
& & o_3 \mapsto acl_{o3}, \\
& & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_1, u_2\}, ActWriters := \{u_1\}], \\
& & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 9

COMMENT El solicitante pertenece a un grupo dueo del objeto que est abierto en modo $READ - WRITE$ por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner \; := \; u_2, \\
 & & \quad\quad group \; := \; g_1, \\
 & & \quad\quad UserReaders \; := \; \{u_1, u_2\}, \\
 & & \quad\quad GroupReaders \; := \; \emptyset, \\
 & & \quad\quad UserWriters \; := \; \emptyset, \\
 & & \quad\quad GroupWriters \; := \; \{AG\}, \\
 & & \quad\quad UserOwners \; := \; \{u_2\}, \\
 & & \quad\quad GroupOwners \; := \; \{RG, g\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \; \mapsto \; [ActReaders := \{u_1, u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \; \mapsto \; [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 10

COMMENT El solicitante es dueo UNIX del objeto pero este no est abierto por el otro usuario, el objeto est abierto por un tercer usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}{lll} owner & := & u, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \;\; \mapsto \;\; [ActReaders := \{u_2\}, ActWriters := \emptyset], \\
 & & o_3 \;\; \mapsto \;\; [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 11

COMMENT El solicitante es dueo UNIX del objeto pero este no est abierto por el otro usuario; el otro usuario tiene abierto otro objeto.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto \begin{array}[t]{lll}
[owner & := & u, \\
group & := & g_1, \\
UserReaders & := & \{u_1, u_2\}, \\
GroupReaders & := & \emptyset, \\
UserWriters & := & \emptyset, \\
GroupWriters & := & \{AG\}, \\
UserOwners & := & \{u\}, \\
GroupOwners & := & \{RG\}],
\end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 12

COMMENT El solicitante es dueo UNIX del objeto pero este no est abierto por el otro usuario.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 13

COMMENT El solicitante no es dueo del objeto que est est abierto por el otro usuario en modo $READ$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_2, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u_2\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_1, u_2\}, ActWriters := \emptyset], \\
 & & o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 14

COMMENT El solicitante no es dueo del objeto que est est abierto por el otro usuario en modo $WRITE$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_2, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u_2\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_/\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El solicitante no es dueo del objeto que est est abierto por el otro usuario en modo $READ - WRITE$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u_2, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u_2\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_1, u_2\}, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 15

COMMENT El solicitante no es dueo del objeto que est est abierto por un tercer usuario en modo $READ - WRITE$.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [\begin{array}[t]{lll} owner & := & u_2, \\ group & := & g_1, \\ UserReaders & := & \{u_1, u_2\}, \\ GroupReaders & := & \emptyset, \\ UserWriters & := & \emptyset, \\ GroupWriters & := & \{AG\}, \\ UserOwners & := & \{u_2\}, \\ GroupOwners & := & \{RG\}], \end{array} \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \ \mapsto \ [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & o_3 \ \mapsto \ [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 16

COMMENT El solicitante es dueo, el segundo usuario no existe, el objeto existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}], \\
 & & o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_{ne} : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 17

COMMENT El solicitante es dueo, el segundo usuario tambin, el objeto no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & \{o \mapsto [owner := u, \\
 & & \quad group := g_1, \\
 & & \quad UserReaders := \{u_1, u_2\}, \\
 & & \quad GroupReaders := \emptyset, \\
 & & \quad UserWriters := \emptyset, \\
 & & \quad GroupWriters := \{AG\}, \\
 & & \quad UserOwners := \{u\}, \\
 & & \quad GroupOwners := \{RG\}], \\
 & & o_1 \mapsto acl_{o1}, \\
 & & o_2 \mapsto acl_{o2}, \\
 & & o_3 \mapsto acl_{o3}, \\
 & & barra \mapsto acl_{/}\}, \\
secmat & := & \{o \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_1, u_2\}], \\
 & & o_3 \mapsto [ActReaders := \{u_2\}, ActWriters := \{u_2\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u, u_1 : SUBJECT$

PARAMETER $o_f : OBJECT$

END TEST CASE

END OPERATION

Capítulo 17

rmdir

17.1. Constantes

CONSTANT $(set\ OBJECT * SecClass)$

$$
\begin{array}{lllll}
OSC_{od} & ::= & \{o_d & \mapsto & [level := N, categs := \{FBI, NATO\}], \\
 & & o & \mapsto & [level := N, categs := \{FBI, NATO\}], \\
 & & o_1 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\
 & & o_2 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\
 & & o_3 & \mapsto & [level := N, categs := \{FBI, NATO\}], \\
 & & bSC & \} &
\end{array}
$$

CONSTANT $AccessCtrlListData$

$$
\begin{array}{lllll}
acl_{/2} & ::= & [owner & := & root, \\
 & & group & := & RG, \\
 & & UserReaders & := & \{root\}, \\
 & & GroupReaders & := & \{AG\}, \\
 & & UserWriters & := & \{root\}, \\
 & & GroupWriters & := & \{AG\}, \\
 & & UserOwners & := & \{root\}, \\
 & & GroupOwners & := & \{RG\}]
\end{array}
$$

CONSTANT $(set\ OBJECT * AccessCtrlListData)$

$$
\begin{array}{lllll}
ACL_{od} & ::= & \{o_d & \mapsto & acl_o, \\
 & & o & \mapsto & acl_o, \\
 & & o_1 & \mapsto & acl_{o1}, \\
 & & o_2 & \mapsto & acl_{o2}, \\
 & & o_3 & \mapsto & acl_{o3}, \\
 & & barra & \mapsto & acl_{/2}\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina.

17.2. Casos de prueba

OPERATION rmdir

BEGIN TEST CASE 1

COMMENT El directorio existe, el solicitante puede borrarlo.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_{od}, \\
acl & := & ACL_{od}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El directorio no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT No es un directorio.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_2, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El directorio existe pero el directorio-padre no est abierto por el solicitante.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_{od}, \\
acl & := & ACL_{od}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El directorio existe pero el directorio-padre est abierto para lectura por el solicitante.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_{od}, \\
acl & := & ACL_{od}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u_1, u\}, ActWriters := \{u_1\}]\}, \\
files & := & F_2, \\
directories & := & D_{od}]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_d : OBJECT$

END TEST CASE

END OPERATION

Capítulo 18

unlink

18.1. Constantes

CONSTANT $(set\ OBJECT * AccessCtrlListData)$

$$
\begin{array}{lllll}
ACL_{/2} & ::= & \{o & \mapsto & acl_o, \\
 & & o_1 & \mapsto & acl_{o1}, \\
 & & o_2 & \mapsto & acl_{o2}, \\
 & & o_3 & \mapsto & acl_{o3}, \\
 & & barra & \mapsto & acl_{/2}\}
\end{array}
$$

Casos de prueba a partir de la pgina siguiente a razn de uno por pgina.

18.2. Casos de prueba

OPERATION unlink

BEGIN TEST CASE 1

COMMENT El archivo existe, el solicitante puede borrarlo.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_{/2}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 2

COMMENT El archivo no existe.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lcl}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_{/2}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o_{ne} : OBJECT$

END TEST CASE

BEGIN TEST CASE 3

COMMENT No es un archivo.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_{/2}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u\}, ActWriters := \{u\}]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $barra : OBJECT$

END TEST CASE

BEGIN TEST CASE 4

COMMENT El archivo existe pero el directorio-padre no est abierto por el solicitante.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_{/2}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

BEGIN TEST CASE 5

COMMENT El archivo existe pero el directorio-padre slo est abierto para lectura por el solicitante.

BELONGS TO

STATE PARAMETER $s : SFSstate :=$

$$
\begin{array}{lll}
[groups & := & G_3, \\
primaryGrp & := & PG_3, \\
subjectSC & := & SSC_2, \\
AllGrp & := & AG, \\
RootGrp & := & RG, \\
SecAdmGrp & := & SAG, \\
objectSC & := & OSC_2, \\
acl & := & ACL_{/2}, \\
secmat & := & \{o_1 \mapsto [ActReaders := \{u_1\}, ActWriters := \emptyset], \\
 & & o_2 \mapsto [ActReaders := \emptyset, ActWriters := \{u_1\}], \\
 & & o_3 \mapsto [ActReaders := \{u_1\}, ActWriters := \{u_1\}], \\
 & & barra \mapsto [ActReaders := \{u_1, u\}, ActWriters := \emptyset]\}, \\
files & := & F_2, \\
directories & := & D_2]
\end{array}
$$

PARAMETER $u : SUBJECT$

PARAMETER $o : OBJECT$

END TEST CASE

END OPERATION

Capítulo 19

write

Esta operacin no se testea pues no ha sido modificada por el equipo de implementacin.