IBM SecureWay™ Firewall for AIX

Reference

Version 4 Release 1

SC31-8418-03

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Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 197.

Edition

This edition applies to Version 4 Release 1 of the IBM SecureWay Firewall for AIX (product number 5697-F48). This edition replaces SC31-8418-02.

Contents

About This Book

This book is intended as a reference for network or system security administrators who install, administer, and use the IBM® SecureWay™ Firewall on an AIX/6000®. To use client programs such as Telnet or FTP, see the user's guide for your TCP/IP client programs.

Prerequisite Knowledge

It is important that you have a sound knowledge of TCP/IP and network administration before you install and configure the IBM SecureWay Firewall. Because you will set up and configure a firewall that controls the access in and out of your network, you must first understand how the network operates. Especially, you need to understand the basics of IP addresses, fully qualified names, and subnet masks.

A recommended book on TCP/IP that covers netstat, arp, ifconfig, ping, nslookup, DNS, sendmail, routing, and much more is *TCP/IP Network Administration*. See "Bibliography" on page 195 for more details.

A recommended book for those performing UNIX administration, that also gives and excellent overview of TCP/IP and routing, network hardware, DNS, and sendmail is the *UNIX System Administration Handbook*. See the *Bibliography* for more details.

Enhancements

The IBM SecureWay Firewall V4R1 for AIX ®offers numerous extensions:

- Enhanced IPSec support including 3DES encryption support
- Multi-processor support
- Filters enhancements
- Secure mail proxy enhancements
- Network address translation (NAT) many-to-one
- An enhanced HTTP Proxy using IBM Web Traffic Express technology
- Socks protocol version 5
- Setup wizard
- Network Security Auditor (NSA) enhancements
- National Language Support for German

Enhanced IPSec Support

The IBM SecureWay Firewall V4R1 includes enhanced IPSec support including triple-DES encryption, support for new headers, multi-processor support, and interoperability with a number of IBM servers and routers as well as a number of non-IBM VPN devices that support the new headers.

Multi-Processor (MP) Support

The Firewall is MP-safe and users can exploit the multi-processor features of the RS/6000 for scaling and performance improvements.

Filters Enhancements

Filters have been enhanced to provide better performance and more flexibility with configuration. You can tune the performance of your Firewall by choosing where to locate different types of filter rules. In addition, a frequency indicator provides the number of times a connection is used.

Secure Mail Proxy

The IBM Firewall Secure Mail Proxy has been enhanced to include the following new functions:

- Anti-SPAM algorithms including message blocking from known SPAMers (an exclusion list), verification checks on the validity and replyability of messages (known ways of blocking undesirable messages), configurable limits on the number of recipients per mail messages, configurable limits on the maximum size of a message
- Anti-spoofing support including integration with strong authentication mechanisms

Socks Protocol Version 5

In addition to its simplicity and flexibility, Socks protocol version 5 offers these advantages:

- Easy deployment of authentication and encryption methods
- UDP association, which creates a virtual proxy circuit for traversing UDP-based proxy circuits
- Ability to chain socks servers
- Socks5 Watcher, which displays real-time socks performance information

Network Address Translation

By using port numbers to create unique mappings, Network address translation (NAT) allows the firewall to translate many secure addresses into one public address.

HTTP Proxy

The IBM SecureWay Firewall provides a full-featured HTTP proxy implementation based upon the IBM Web Traffic Express (WTE) product. The HTTP proxy efficiently handles browser requests through the IBM Firewall eliminating the need for a socks server for Web browsing. Users can access useful information on the Internet, without compromising the security of their internal networks and without altering their client environment to implement HTTP proxy.

Setup Wizard

A wizard has been provided to aid the user with the initial configuration of the IBM SecureWay Firewall. This setup wizard enables a user, who does not have extensive knowledge of the Firewall, to have a basic Firewall configuration up and running quickly after installation of the IBM Firewall.

Network Security Auditor

The Network Security Auditor (NSA) is a tool that checks your network servers and the Firewall for security holes or configuration errors. It has been enhanced to be faster and more robust.

By periodically running the Network Security Auditor, you can ensure that nothing has been changed in a way that creates a security vulnerability, especially after you put the Firewall online.

National Language Support for German

National language support for German is offered in addition to Brazilian Portugese, English, French, Italian, Japanese, Korean, simplified Chinese, Spanish, and traditional Chinese.

Terminology

You can access the IBM Software glossary at:
http://www.networking.ibm.com/nsg/nsgmain.htm.

How to Call IBM for Service

The IBM Support Center provides you with telephone assistance in problem diagnosis and resolution. You can call the IBM Support Center at any time; you will receive a return call within eight business hours (Monday–Friday, 8:00 a.m.–5:00 p.m., local customer time). The number to call is 1-800-237-5511. Or you can access the following web site:
http://www.software.ibm.com/security/firewall/support/ and specify the country where service is required.

Outside the United States or Puerto Rico, contact your local IBM representative or your authorized IBM supplier.

Chapter 1. Using the IBM Firewall Command Line Interface

This chapter discusses commands that you can use from an IBM SecureWay Firewall command line.

The following information applies to the commands:

- The commands listed in this book use the following syntax:
  - *underlined* indicates this is user data.
  - [] indicates a parameter is optional.
  - {} indicates the user has a choice of parameters.
  - | separates choices.
- All parameters use a `keyword=value` format.
- If a parameter has multiple values the values should be within double quotes and be delimited by blank spaces, for example:

  ```
  secaddr="11.22.33.1 11.22.33.2"
  ```
- Do not include spaces inside any parameter unless it is within double quotes.
- If you omit one or more required parameters, the command-line utility lists missing parameters.
- If an invalid value for a parameter is entered, the command-line utility reports this error.
- Some of the firewall daemons dynamically update their behavior when their configuration files change. Some require an update subcommand. An `update` subcommand is provided for those daemons that require an instruction.
- Only firewall administrators can execute programs from the command line.
- Because of the complexity and file interdependencies, **do not directly edit any configuration files**.

Adapters

To list the adapters, issue the following command.

```
fwadapter cmd=list
       [addr=AdapterAddress]
```

addr=*AdapterAddress*
: Lists all adapters attached to this machine and identifies each as being either a secure or a nonsecure adapter. If the optional *addr* parameter is specified, only that adapter is listed.

To change the adapters, issue the following command.

```
fwadapter cmd=change
       addr=AdapterAddress
       state={secure|nonsecure}
```

The parameter definitions are:

addr=*AdapterAddress*
: Address of the adapter to change.

state={secure | nonsecure}
: Sets the secure/nonsecure state of the adapter answering to the specified IP address.

Configuration Server

The fwcfgsrv command lists or changes the configuration server's options. An administrator must have the authority to administer traffic control functions to issue this command.

To list the configuration server options, issue the following command.

```
fwcfgsrv cmd=list
```

The output from the fwcfgsrv command looks like this:

```
localonly = yes/no
encryption = none/ssl
sslfile = filename if one is defined
```

To change the configuration server options, issue the following command.

```
fwcfgsrv cmd=change
         [localonly={yes|no}]
         [encryption={none|ssl}]
         [sslfile=]
```

The parameter definitions are:

localonly
Indicates if the firewall can only be administered from a local machine. Valid values are yes or no.

encryption
Indicates if the configuration server expects incoming data to be encrypted through SSL or not. Valid values are none or SSL.

sslfile Indicates the SSL key file name to be used for SSL encryption.

Security Policies

The fwconns command modifies and lists the defined security policy options.

To list the defined security policy options, issue the following command.

```
fwconns cmd=list name=lblSecurityPolicy
```

To modify the defined security policy options, issue the following command.

```
fwconns cmd=change
        [servicelist=[id1,id2,....,idn]]
```

Note that if cmd=change is the parameter specified, the command will prompt the user for each of the security policy options.

The DNS security policy for this firewall:

id=20 Permit DNS queries.

id=21 Permit DNS zone transfers.

The logging security policy for this firewall:

id=23 Deny broadcast message to nonsecure interface.

The Socks security policy for this firewall:

id=34 Deny Socks to nonsecure interface.

The temporary security policy for this firewall:

id=26 Shutdown service interface.

id=25 Test IP Routing (debug only).

Network Objects

The `fwnwobj` command is used to create, modify, delete, and list network objects, which are used as endpoints in connections or as members of network object groups. See the *IBM SecureWay Firewall User's Guide* for a complete description of network objects.

To create a network object, issue the following command.

```
fwnwobj cmd=add
        name=name
        [desc=description]
        type={Host|Network|Firewall|Router|Interface}
        [addr=x.x.x.x]
        [mask=x.x.x.x]
```

The parameter definitions are:

name Is the name you want to give this network object.

desc Is a description of this network object.

type Is the type of object that you want to create.

addr Is the IP address for this network object. This parameter is not valid if *type=user*.

mask Is a mask to indicate how much of the IP address is used in comparisons. This parameter is not valid if *type=user*.

To modify a network object, issue the following command.

```
fwnwobj cmd=change
        {name=name | id=id}
        [desc=[description]]
        [type={Host|Network|Firewall|Router|Interface|}]
        [addr=x.x.x.x]
        [mask=x.x.x.x]
```

The parameter definitions are:

name Is the name of the network object you want to change.

id Is the ID number of the network object you want to change.

desc Is a description of this network object.

type Is the type of object.

addr Is the IP address for this network object. This parameter is not valid if *type=user*.

mask Is a mask to indicate how much of the IP address is used in comparisons. This parameter is not valid if *type=user*.

To delete a network object, issue the following command.

```
fwnwobj cmd=delete
        {name=name | id=id}
        [force={yes|no}]
```

The parameter definitions are:

name Is the name of the network object you want to delete.

id Is the ID number of the network object you want to delete.

force Indicates whether or not this object should be deleted even if other objects are dependent on it.

To list a network object, issue the following command.

```
fwnwobj cmd=list
        [name=name] | [id=id]
        [format={short|long|wide|raw}]
```

The parameter definitions are:

name Is the name of the network object you want to list.

id Is the ID number of the network object you want to list.

format
Describes the format of this command's output.

Note: If you do not supply a name or an ID, then all network objects will be listed.

Network Object Groups

The `fwnwgrp` command is used to create, modify, delete, and list network object groups. See the *IBM SecureWay Firewall User's Guide* for a complete description of network object groups.

To create a network object group, issue the following command.

```
fwnwgrp cmd=create
        name=name
        [desc=description]
        [idlist=id1,id2,...,idn]
        [namelist="name 1|name2|...|name n"]
```

The parameter definitions are:

name Is the name you want to give to this network object group.

desc Is a description of this network object group.

idlist Is a list of network objects by ID number that you want to have in the network object group.

namelist
Is a list of network objects by name that you want to have in the network object group.

To modify a network object group, issue the following command.

```
fwnwgrp cmd=change
        {name=name | id=id}
        [desc=[description]]
        [idlist=[id1,id2,...,idn]]
        [namelist=["name 1|name2|...|name n"]]
```

The parameter definitions are:

name Is the name of the network object group that you want to change.

id Is the ID number of the network object group that you want to change.

desc Is a description of this network object group.

idlist Is a list of network objects by ID number that you want to have in the network object group.

namelist
Is a list of network objects by name that you want to have in the network object group.

To delete a network object group, issue the following command.

```
fwnwgrp cmd=delete
        {name=name | id=id}
        [force={yes|no}]
```

The parameter definitions are:

name Is the name of the network object group that you want to delete.

id Is the ID number of the network object group that you want to delete.

force Indicates whether or not this group should be deleted even if other objects are dependent on it.

To list a network object group, issue the following command.

```
fwnwgrp cmd=list
        {name=name | id=id}
        [format={short|long|wide|raw|all}]
```

The parameter definitions are:

name Is the name of the network object group that you want to list.

id Is the ID number of the network object group that you want to list.

format
Describes the format of the command's output.

To add network objects to a network object group, issue the following command.

```
fwnwgrp cmd=add
        {name=name | id=id}
        {idlist=id1,id2,...,idn| and/or
        namelist="name 1|name2|...|name n"}
```

The parameter definitions are:

name Is the name of the network object group that you want to change.

id Is the ID number of the network object group that you want to change.

idlist Is a list of network objects by ID number that you want to add to the network object group.

namelist
Is a list of network objects by name that you want to add to the network object group.

To remove network objects from a network object group, issue the following command.

```
fwnwgrp cmd=remove
        {name=name | id=id}
        {idlist=id1,id2,...,idn| and/or
        namelist="name 1|name2|...|name n"}
```

The parameter definitions are:

name Is the name of the network object group that you want to change.

id Is the ID number of the network object group that you want to change.

idlist Is a list of network objects by ID number that you want to remove from the network object group.

namelist
Is a list of network objects by name that you want to remove from the network object group.

Connections

The `fwconns` command is used to create, modify, delete and list firewall connections. These connections associate network objects with services and/or socks templates to define the types of communications allowed between endpoints. For more information on connections, see the *IBM SecureWay Firewall User's Guide*.

To create firewall connections, issue the following command.

```
fwconns cmd=create
        [type={upper|lower|ra}]
        name=_name_
        [desc=_description_]
        source=network_id_or_name
        [destination=network_id_or_name]
        {servicelist=service_id1,service_id2,...,
service_idn |
         sockslist=socks_id1,socks_id2,...,socks_idn}
         cmd=activate
           {name=_name | id=_id_}
         cmd=deactivate
           {name=_name_| id=_id_}
```

The parameter definitions are:

name Is the name you want to give to this connection.

desc Is a description of this connection.

source Is the source network object name or ID number for the connection.

destination
Is the destination network object name or ID number for the connection.

servicelist
Is a list of services by ID number to include in this connection.

sockslist
Is a list of socks rules by ID number to include in this connection.

To modify firewall connections, issue the following command.

```
fwconns cmd=change
        {name=_name_ | id=_id_}
        [desc=[_description_]]
        [source=network_id_or_name]
```

```
        [destination=[network_id_or_name]]
        [servicelist=[service_id1,service_id2,...,service_idn]]
        [sockslist=[socks_id1,socks_id2,...,socks_idn]]
```

The parameter definitions are:

name Is the name of the connection you want to change.

id Is the ID number of the connection you want to change.

desc Is the new description of this connection. If this description parameter is supplied with no value, the description is removed.

servicelist
Is a list of services by ID number to include in this connection.

sockslist
Is a list of socks rules by ID number to include in this connection.

To delete firewall connections, issue the following command.

```
fwconns cmd=delete
        {name=_name_ | id=_id_}
```

The parameter definitions are:

name Is the name of the connection you want to delete.

id Is the ID number of the connection you want to delete.

To list firewall connections, issue the following command.

```
fwconns cmd=list
        [name=_name_ | id=_id_]
        [format={short|long|wide|raw}]
```

The parameter definitions are:

name Is the name of the connection you want to list.

id Is the ID number of the connection you want to list. If you do not supply a name or an ID, all connections are listed.

format
Describes the format of this command's output.

To move firewall connections, issue the following command.

```
fwconns cmd=move
        connection=connection_id_or_name
        after=[connection_id_or_name]
```

The parameter definitions are:

connection
Is the name or ID number of the connection you want to move.

after Is the name or ID number that the moved connection should follow.

To add a firewall service to a connection, issue the following command.

```
fwconns cmd=addservice
        servicelist=service_id1,service_id2,...,service_idn
        connection=connection_id_or_name
```

The parameter definitions are:

servicelist
Is a list of services by ID number that you want to add to the connection.

connection
Is the name or ID number of the connection you want to change.

To remove a firewall service from a connection, issue the following command.

```
fwconns cmd=removeservice
        servicelist=service_id1,service_id2,...,service_idn
        connection=connection_id_or_name
```

The parameter definitions are:

servicelist
Is a list of services by ID number that you want to remove from the connection.

connection
Is the name or ID number of the connection you want to change.

To move a firewall service within a connection, issue the following command.

```
fwconns cmd=moveservice
        service=service_id_or_name
        after=[service_id_or_name]
        connection=connection_id_or_name
```

The parameter definitions are:

service
Is the name or ID number of a specific service that you want to move within the connection.

after Is the name or ID number that the moved service should follow.

connection
Is the name or ID number of the connection you want to change.

To add socks rules within a connection, issue the following command.

```
fwconns cmd=addsocks
        sockslist=socks_id1,socks_id2,...,socks_idn
        connection=connection_id_or_name
```

The parameter definitions are:

sockslist
Is a list of socks rules by ID number that you want to add to the connection.

connection
Is the name or ID number of the connection you want to change.

To remove socks rules within a connection, issue the following command.

```
fwconns cmd=removesocks
        sockslist=socks_id1,socks_id2,...,socks_idn
        connection=connection_id_or_name
```

The parameter definitions are:

sockslist
Is a list of socks rules by ID number that you want to remove from the connection.

connection
Is the name or ID number of the connection you want to change.

To move socks rules within a connection, issue the following command.

```
fwconns cmd=movesocks
        socks=socks_id_or_name
        after=[socks_id_or_name]
        connection=connection_id_or_name
```

The parameter definitions are:

socks Is the name or ID number of a socks rule you want to move within the connection.

after Is the name or ID number of a socks rule that the moved socks rule should follow.

connection
Is the name or ID number of the connection you want to change.

Services

The `fwservice` command allows you to create, modify, delete, and list services, which are collections of filter rules that implement a protocol. See the *IBM SecureWay Firewall User's Guide* for more information about setting up services.

To create a service, issue the following command.

```
fwservice cmd=create
          name=name
          [desc=description]
          [rulelist=id1/{f|b},id2/{f|b},...,idn/{f|b}]
          [log={yes|no}]
          [fragment={yes|no|only|headers}]
          [tunnel=tunnel_id]
          [time=hhmm-hhmm]         (hh = 00-23, mm = 00-59)
          [month=mmm[-mmm]]        (mmm = Jan,Feb,...,Dec)
          [day=nn[-nn]]            (nn = 1,2,...,29 or 30 or 31)
          [weekday=ddd[-ddd]]      (ddd = Sun,Mon,...,Sat)
          [timefilter={activate|deactivate}]
```

The parameter definitions are:

name Is the name you want to give to this service.

desc Is the description of the service.

rulelist
Is a list of rules by ID number and flow direction for this service. *f* indicates a flow of left to right and *b* indicates a flow of right to left.

log Indicates whether logging will occur for this service.

fragment
Indicates the type of fragment control for this service.

tunnel Indicates a tunnel id number for this service.

time Indicates a timeframe by hour for this service to be active or inactive.

month Indicates a timeframe by month for this service to be active or inactive.

day Indicates a timeframe by day of the month for this service to be active or inactive.

weekday
Indicates a timeframe by weekday for this service to be active or inactive.

timefilter
Indicates whether this service should be active or inactive during the specified timeframe.

To modify a service, issue the following command.

```
fwservice cmd=change
          {name=name  | id=id}
          [desc=[description]]
          [rulelist=[id1/{f|b},id2/{f|b},...,idn/{f|b}]]
          [log=[{yes|no}]]
          [fragment=[{yes|no|only|headers}]]
          [tunnel=[tunnel_id]]
          [time=hhmm-hhmm]      (hh = 00-23, mm = 00-59)
          [month=mmm[-mmm]]     (mmm = Jan,Feb,...,Dec)
          [day=nn[-nn]]         (nn = 1,2,...,29 or 30 or 31)
          [weekday=ddd[-ddd]]   (ddd = Sun,Mon,...,Sat)
          [timefilter=[{activate|deactivate}]]
```

The parameter definitions are:

name Is the name of the service you want to change.

id Is the ID number of the service you want to change.

desc Is the description of the service.

rulelist
Is a list of rules by ID number and flow direction for this service. *f* indicates a flow of left to right and *b* indicates a flow of right to left.

log Indicates whether logging will occur for this service.

fragment
Indicates the type of fragment control for this service.

tunnel Indicates a tunnel id number for this service.

time Indicates a timeframe by hour for this service to be active or inactive.

month Indicates a timeframe by month for this service to be active or inactive.

day Indicates a timeframe by day of the month for this service to be active or inactive.

weekday
Indicates a timeframe by weekday for this service to be active or inactive.

timefilter
Indicates whether this service should be active or inactive during the specified timeframe.

To delete a service, issue the following command.

```
fwservice cmd=delete
          {name=name | id=id}
          [force={yes|no}]
```

The parameter definitions are:

name Is the name of the service you want to delete.

id Is the ID number of the service you want to delete.

force Indicates whether or not this service should be deleted even if other objects are dependent upon it.

To list a service, issue the following command.

```
fwservice cmd=list
          [name=name | id=id]
          [format={short|long|wide|raw}]
```

The parameter definitions are:

name Is the name of the service you want to list.

id Is the ID number of the service you want to list.

format
Describes the format of the command's output.

To add a list of rules to a service, issue the following command.

```
fwservice cmd=add
          rulelist=id1/{f|b},id2/{f|b},...,idn/{f|b}
          service=service_id_or_name
```

The parameter definitions are:

rulelist
Is a list of rules by ID number and flow direction to add to this service. *f* indicates a flow of left to right and *b* indicates a flow of right to left.

service
Is the name or ID number of the service you want to change.

To remove a list of rules to a service, issue the following command.

```
fwservice cmd=remove
          rulelist=id1/{f|b},id2/{f|b},...,idn/{f|b}
          service=service_id_or_name
```

The parameter definitions are:

rulelist
Is a list of rules by ID number and flow direction to remove from this service. *f* indicates a flow of left to right and *b* indicates a flow of right to left.

service
Is the name or ID number of the service you want to change.

To move a rule within a service, issue the following command.

```
fwservice cmd=move
          rule=id/{f|b}
          after=[id/{f|b}]
          service=service_id_or_name
```

The parameter definitions are:

rule Is the ID number and flow direction for the rule you want to move in this service.

after Is the ID number and flow direction of the rule you want the moved rule to follow.

service
Is the name or ID number of the service you want to change.

Rules

Use the `fwfrule` command to create, modify, delete, and list rule templates used to create a service. See the *IBM SecureWay Firewall User's Guide* for a full explanation of the parameters used on this command

To add rule templates, use the following command.

```
fwfrule cmd=add
       name=name
       [desc=description]
       type={permit|deny}
       protocol={all|tcp/ack|udp|icmp|ospf|ipip|esp|ah}
       [srcopcode={any|eq|neq|lt|gt|le|ge}]
       [srcport=port_num]
       [destopcode={any|eq|neq|lt|gt|le|ge}]
       [destport=port_num]
       interface={both|secure|nonsecure}
       routing={both|local|route}
       direction={both|inbound|outbound}
       [log={yes|no}]
       [tunnel=tunnel_id]
       [fragment={yes|no|only|headers}]
```

The parameter definitions are:

name Is the name you want to give to this filter rule.

desc Is the description of the filter rule.

type Indicates if the rule will permit or deny traffic.

protocol
Is the protocol type for this rule.

srcopcode
Indicates the logical operation to be performed on the source port number.

srcport
Indicates the source port number for this rule (0–65535).

destopcode
Indicates the logical operation to be performed on the destination port number.

destport
Indicates the destination port number for this rule (0–65535).

interface
Indicates which interfaces this rule applies to.

routing
Indicates the destination of traffic for this rule.

direction
Indicates the direction of traffic for this rule.

log Indicates whether or not log records will be written when this rule is matched.

tunnel Indicates a tunnel id for this rule (1–999999).

fragment
Indicates the type of fragment control for this rule.

To modify rule templates, use the following command.

```
fwfrule cmd=change
       name=name | id=ruleid
       [desc=[description]]
       [type={permit|deny}]
       [protocol={all|tcp/ack|udp|icmp|ospf|ipip|esp|ah}]
       [srcopcode=[{any|eq|neq|lt|gt|le|ge}]]
       [srcport=[port_num]]
       [destopcode=[{any|eq|neq|lt|gt|le|ge}]]
       [destport=[port_num]]
       [interface={both|secure|nonsecure}]
       [routing={both|local|route}]
       [direction={both|inbound|outbound}]
       [log=[{yes|no}]]
       [tunnel=[tunnel_id]]
       [fragment=[{yes|no|only|headers}]]
```

The parameter definitions are:

name Is the name of the filter rule you want to change.

id Is the ID number of the filter rule you want to change.

desc Is the description of the filter rule.

type Indicates if the rule will permit or deny traffic.

protocol
Is the protocol type for this rule.

srcopcode
Indicates which source port numbers apply to this rule.

srcport
Indicates the source port number for this rule (0–65535).

destopcode
Indicates which destination port numbers apply to this rule.

destport
Indicates the destination port number for this rule (0–65535).

interface
Indicates which interfaces this rule applies to.

routing
Indicates the destination of traffic for this rule.

direction
Indicates the direction of traffic for this rule.

log Indicates whether or not log records will be written when this rule is matched.

tunnel Indicates a tunnel id for this rule (1–999999).

fragment
Indicates the type of fragment control for this rule.

To delete rule templates, use the following command.

```
fwfrule cmd=delete
       name=name | id=ruleid
       [force={yes|no}]
```

The parameter definitions are:

name Is the name of the filter rule you want to delete.

id Is the ID number of the filter rule you want to delete.

force Indicates whether or not this rule should be deleted even if other objects are dependent upon it.

To list rule templates, use the following command.

```
fwfrule cmd=list
       [name=name] | [id=ruleid]
       [format={short|long|wide|raw}]
```

The parameter definitions are:

name Is the name of the filter rule you want to list.

id Is the ID number of the filter rule you want to list.

format
Describes the format of the command's output.

Socks Rules

The `fwsrule` command is used to create, modify, delete, and list Socks rules. See the *IBM SecureWay Firewall User's Guide* for a complete explanation of the Socks rules concepts.

To add a socks rule, issue the following command.

```
fwsrule cmd=add
        name=name
        [desc=description]
        type={permit|deny}
        [identd={None|?=I|?=i|?=n}]
        [userid=userid1,userid2,...,useridn]
        [operator={eq|neq|lt|gt|le|ge}]
        [port=port_num] (port_num=0-65535)
        [rulecommand="rule command"]
```

The parameter definitions are:

name Is the name you want to give this Socks rule.

desc Is the description of the Socks rule.

type Indicates if this rule will permit or deny traffic.

identd Indicates how to use the results of user identification through identd.

userid Is a list of users on the requesting host.

operator
Indicates the logical operation to be performed on the port number.

port Indicates a port number (0–65535).

rulecommand
A command string to be executed when the rule conditions are satisfied.

To modify a socks rule, issue the following command.

```
fwsrule cmd=change
        {name=name | id=id}
        [desc=[description]]
        [type={permit|deny}]
        [identd=[{None|?=I|?=i|?=n}]]
```

```
[userid=[userid1,userid2,...,useridn]]
[operator=[{eq|neq|lt|gt|le|ge}]]
[port=[port_num]]  (port_num=0-65535)
[rulecommand=["rule command"]]
```

The parameter definitions are:

name Is the name of the Socks rule you want to change.

id Is the ID number of the Socks rule you want to change.

desc Is the description of the Socks rule.

type Indicates if this rule will permit or deny traffic.

identd Indicates how to use the results of user identification through identd.

userid Is a list of users on the requesting host.

operator
Indicates the logical operation to be performed on the port number.

port Indicates a port number (0–65535).

rulecommand
A command string to be executed when the rule conditions are satisfied.

To delete a socks rule, issue the following command.

```
fwsrule cmd=delete
        {name=name | id=id}
        [force={yes|no}]
```

The parameter definitions are:

name Is the name of the Socks rule you want to delete.

id Is the ID number of the Socks rule you want to delete.

force Indicates whether or not this rule should be deleted even if other objects are dependent upon it.

To list a socks rule, issue the following command.

```
fwsrule cmd=list
        [{name=name | id=id}]
        [format={short|long|wide|raw}]
```

The parameter definitions are:

name Is the name of the Socks rule you want to list.

id Is the ID number of the Socks rule you want to list.

format
Describes the format of this comment's output.

Filters Configuration Control

Use the `fwfilter` command to activate and deactivate filter rules.

```
fwfilter cmd=update |list | shutdown | startlog | stoplog
```

The parameter definitions are:

fwfilter cmd=update
rebuilds the configuration and activates that rule set.

fwfilter cmd=list
lists the most recently built configuration

fwfilter cmd=shutdown
deactivates the filters mechanism

fwfilter cmd=startlog
logs selected traffic to the `firewall log` facility

fwfilter cmd=stoplog
stops the firewall filter logging

Domain Name Services

The Domain Name Service (DNS) provides full domain name service to hosts inside the secure network while providing minimal information to hosts outside the secure network. Three domain name servers are required to accomplish this:

- One at the firewall
- One inside the secure network
- One outside the secure network.

See the *IBM SecureWay Firewall User's Guide* for more information.

Note:

1. The x.x.x.x is an IP address in its dotted decimal format.
2. The value for the secaddr and remaddr parameters can be a single IP address or a list of IP addresses. If a list of IP addresses is specified, the list should be space delimited and contained within double quotes.
3. Duplicate addresses are detected and flagged as an error.
4. The first time DNS is configured, `fwdns cmd=change` creates the new file. The firewall will always have exactly one DNS configuration record. The values may be empty. The change subcommand is sufficient to change any or all of the values in the DNS record.

The following command lists the current DNS configuration.

```
fwdns cmd=list
```

To change the DNS configuration entry and create a new file:

```
fwdns cmd=change
       secdomain=SecureDomainName
       secaddr=x.x.x.x  | "x.x.x.x  x.x.x.x  x.x.x.x"
       remaddr=x.x.x.x  | "x.x.x.x  x.x.x.x  x.x.x.x"
```

The parameter definitions are:

secdomain=*SecureDomainName*
domain name of your internal, secure network

secaddr=*SecureDNSaddr[...]*
IP address of your secure domain name servers

remaddr=*NonSecureDNSaddr[...]*
IP address the domain name servers outside your secured network that are provided by your Internet connection service provider.

Enterprise Firewall Manager

Enterprise Firewall Manager (EFM) allows for selective management of one firewall's configuration file from another firewall.

To read the EFM's security agreement record for the specified firewall and get a list of functions that can be administered at the EFM, use the following command.

```
fwmanager cmd=list
        type=secagree
        firewallname=FirewallName
```

The parameter definitions are:

cmd=list
Lists each function in the security agreement and indicates whether the EFM or the managed firewall can configure that function.

type=secagree
the security agreement.

firewallname=*Firewallname*
The name of the firewall.

To return a list of functions that have been modified since the last time configuration files were downloaded for the firewall use the `fwtransfer` command. The administrator can also use this command to confirm changes prior to initiating the `fwtransfer cmd=transfer type=changed` command.

```
fwtransfer cmd=list
        type=changed
        firewallname=FirewallName
```

The parameter definitions are:

cmd=list
Returns a list of functions that have been modified since the last time configuration files were downloaded for the Firewall.

type=changed
Lists the functions that have had configuration file changes.

firewallname=*Firewallname*
The name of the firewall.

To download configuration files for requested functions to the specified firewall use the following command.

```
fwtransfer cmd=transfer
        type=changed
        firewallname=FirewallName
        service=[all |"DNS securemail traffic NAT
        pagersup interface logmonitor proxyadmin logfacility secagree SNMP"]
```

The parameter definitions are:

type=changed
Configuration files that have been modified for requested services if a change has been made to the file since the last time the file was downloaded.

firewallname=*Firewallname*
The name of the firewall.

service=
Specifies services. The default is all.

The secagree service type also includes session limit changes.

To transfer configuration files regardless of whether they have changed, use the following command.

```
fwtransfer cmd=transfer
        type=select
        firewallname=FirewallName
        service=[all |"DNS securemail traffic NAT
                 pagersup interface logmonitor proxyadmin
                 logfacility secagree SNMP"]
```

The parameter definitions are:

type=select
Forces the download of configuration files for specified services.

firewallname=*Firewallname*
The name of the firewall.

service=
Specifies services. The default is all. The secagree service type also includes session limit changes.

To activate configuration files previously downloaded to the managed firewall, use the following command.

```
fwact firewallname=FirewallName
           service=[all |"DNS securemail traffic
                    NAT pagersuup interface logmonitor
                    proxyadmin logfacility secagree SNMP"]
```

The parameter definitions are:

firewallname=*Firewallname*
The name of the firewall.

service=
Specifies services. The default is all. The secagree service type also includes session limit changes.

File System Integrity Checker

The following command invokes the File System Integrity Checker.

```
fwfschk
[cmd={-? | -l|
-u | -f}]
```

The parameter definitions are:

fwfschk –?
usage

fwfschk –l
logs output

fwfschk –u
updates database

fwfschk –f
forces the update to the database

Filter Rule Checker

The following command is used to test the firewall's filter rules.

```
fwice  [hosts=HostsFileName]
      [services=ServicesFileName]
      [results=ResultsFileName]
```

This utility is run from a crontab.

HTTP Proxy

HTTP proxy efficiently handles browser requests through the IBM Firewall eliminating the need for a socks server for Web browsing. Users can access useful information on the Internet, without compromising the security of their internal networks and without altering their client environment to implement HTTP proxy.

The `fwhttp` command lists or changes the current HTTP proxy configuration.

To list the current HTTP proxy configuration, use the following command.

```
fwhttp cmd=list
```

To change the current HTTP proxy configuration, use the following command.

```
 [port=]
 [maxbuffer="[x K] | [y M]"]
 [maxthread=]
 [authenticate={all|none}]
 [maxpersistrequest=]
 [persisttimeout="[x hours] [y mins] [z secs]"]
 [httpproxy=]
 [ftpproxy=]
 [gopherproxy=]
 [noproxy=]
 [socks={on|off}]
 [ftpurlpath=]
 [connection=]
 [usedns={on|off}]
 [persist={on|off}]
 [logging=]
 [proxylog=]
 [errorlog=]
 [archive={compress|purge|none}]
 [logtime=]
 [logdelete=]
 [command=]
 [disctime=]
 [purgesize=]
 [inputtimeout="[x hours] [y mins] [z secs]"]
 [activitytimeout="[x hours] [y mins] [z secs]"]
[absolutetimeout="[x hours] [y mins] [z secs]"]
[usesnmp={on|off}]
[snmpcomm=]
[administratorid=]
```

The parameter definitions are:

port Enter the proxy port number the server should listen to for requests. The standard port number is 8080 for Firewall.

maxbuffer
Enter the buffer size for dynamic data generated by the server. The value can be specified in either kilobytes or megabytes.

maxthread
Specify the maximum number of threads that you want to have active at one time. If the maximum is reached, the server holds new requests until another request finishes and threads become available.

authenticate
Use this switch to tell the proxy whether it must require its users to authenticate themselves before the proxy will service a request. Valid values are ″all″ and ″none″. In addition to setting this switch, the relevant user definitions (see `fwuser` command) must have an authentication method set in their **SECHTTP** attribute.

maxpersistrequest
Specify the maximum number of requests the server should receive on a persistent connection.

persisttimeout
Specify the amount of time the server should wait between client requests before cancelling a persistent connection.

httpproxy
If the proxy server is part of a chain of proxies, use proxy chaining to identify the name of another proxy that this server should contact for HTTP requests.

```
http_proxy http://outer.proxy.server/
```

ftpproxy
If the proxy server is part of a chain of proxies, use proxy chaining to identify the name of another proxy that this server should contact for FTP requests.

```
ftp_proxy http://outer.proxy.server/
```

gopherproxy
If the proxy server is part of a chain of proxies, use proxy chaining to identify the name of another proxy that this server should contact for GOPHER requests.

```
gopher_proxy http://outer.proxy.server/
```

noproxy
Domains not to proxy to any request that has not been specified. No_proxy connects directly to domains matching templates. This directive only applies to proxy chaining and is equivalent to a direct @ / = line in the SOCKS configuration file. For example,

```
no_proxy www.someco.com, .raleigh.ibm.com, .some.host.org:8080
```

In the above example, the server would not go through a proxy for the following requests:

- Any requests to domain ending with www.someco.com
- Any requests to domains ending with .raleigh.ibm.com, such as bluegrass.raleigh.ibm.com or keystone.raleigh.ibm.com

- Any requests to port 8080 of domains ending with .some.host.org, such as myname.some.host.org:8080. (this would not include requests to any other ports of the same domain, such as myname.some.host.org, which assumes the default port 80.)

socks Use the Socks configuration file to determine the type of connection to make.Values are on or off.

ftpurlpath
Check the box to specify whether the path information in FTP URLs should be interpreted as being relative to the logged-in user's working directory or as being relative to the root directory. For example, given the URL

```
ftp://user@ftphost.com/my file
```

if this parameter is set to ″relative″, then the proxy will retrieve the file `/u/user/myfile`. If this parameter is set to ″absolute″, then the proxy will retrieve `/myfile`.

connection
Enter the number of listen backlog client connections you want the server to carry before sending connection refused messages to clients.

usedns
Determines whether dns lookups are done to log client hostnames, or just use ip address.

persist
Choose whether you want to allow persistent connections.

logging
Set this value to ″on″ if you want usage information written to the AIX syslog ″user″ facility. Logging to the proxy access logs and error logs and to the firewall's ″local 4″ facility are unaffected.

proxylog
Specify the name of the path where you want to log the access statistics that pertain to proxy requests. You can also choose whether the Proxy Access log should be recorded using the AIX syslog facility. If you set the ″logging″ parameter to ″on″, then the relevant information will appear both in the indicated log file and in the syslog ″user″ facility.

errorlog
Specify the name of the file where you want to log server errors. You can also choose whether the Error log should be recorded using the AIX syslog facility. If you set the ″logging″ parameter to ″on″, then the relevant information will appear both in the indicated log file and in the syslog ″user″ facility

archive
Select the log archiving method. The value is either none, compress, or purge.

logtime
The IBM Firewall compresses the logs that are older than the value (in days) defined by the CompressAge directive into a common zip file. If the value for CompressAge is less than or equal to 0, then no files are compressed.

logdelete
You can delete logs older than the value defined by the CompressDeleteAge to recover space used by the logs.

command
Enter a compress command. The command identifies the compression utility used to compact the logs and passes parameters to that utility. Use double quotes (″ ″) to enclose commands containing spaces.

disctime
When the log is older than the number of days you entered, it will be purged.

purgesize
When the log is older than the number of days you entered, it will be deleted.

inputtimeout
The input timeout determines how long the client will wait to send the first request after the connection is established. Specify the time value in any combination of hours, minutes, and seconds.

activitytimeout
The activity timeout sets the thread timer, which keeps track of how much time has elapsed since the last successful network activity has occurred. Specify the time value in any combination of hours, minutes, and seconds.

absolutetimeout
Specify the time after which a long-running (but not idle) connection is terminated. Specify the time value in any combination of hours, minutes, and seconds.

usesnmp
Check whether you want to enable SNMP. Values are on or off.

snmpcomm
The SNMP community name authorizes a user to view the status of the network.

administraorid
Use the webmaster's email address for the Web server administrator to receive problem reports.

Log Archiver

The following command `fwlogmgmt -1` finds an active log and invokes the logfile archiver to maintain log facilities that have been configured for archiving.

The following command `fwlogmgmt -a` deletes an active log and invokes the logfile archiver to maintain log facilities that have been configured for archiving.

It is useful to put this command in a scheduled cron job. See the *IBM SecureWay Firewall User's Guide* for more information.

Log File Management

Log file management defines and manages your log and archive files. The fwlog command adds, modifies and deletes log facilities.

To add log facilities, issue the following command.

```
fwlog cmd=add
       facility=Facility
       priority=Priority
       logfile=LogFileName
       [arcfile=ArchivePath
       logtime=DaysToKeepInLog
       arctime=DaysToKeepInArchive
       workspace=workspace directory]
```

Valid values for **facility**:

- firewall (local4) - general firewall logs including filter logging
- alert (local1) - log monitor daemon status and threshold violation warnings used to populate the Alerts Display
- syslog - useful in case the other logs fill up their file systems
- * - all facilities

Valid values for **priority**:

- debug
- info
- notice
- warning
- err
- crit
- alert
- emerg

The logfile parameter indicates where the syslog entries should be sent. Valid values for logfile are:

- A fully qualified file name (starting with a '/' character), indicating the file to which the log entries should be written
- A host name prefixed with an '@' sign
- A user name on the firewall or a comma-delimited list of user names on the firewall.

Note: Files identified for the `alert log` or the `firewall log` facilities should be different from each other and different from the files for any other log facility if firewall features will be used to process these files.

It is important that ONLY firewall log messages appear in files input to report utilities. No other facility should be directed to the same file as the firewall log or alert log.

These parameters control log archival. For actual log archival to occur, the `fwlogmgmt` command must be run periodically. See the *IBM SecureWay Firewall User's Guide* for more information.

The arcfile, logtime, arctime, and workspace parameters are optional, and are only valid when the logfile parameter specifies a file name. All four parameters must be specified if any are specified. These parameters control log archival. For actual archival to occur, run the `fwlogmgmt` command periodically. See "Log Archiver" on page 22.

The **arcfile** parameter must contain a fully qualified path and file name.

The **logtime** parameter indicates the minimum number of days a syslog entry will remain in the logfile before being moved to the archive file.

The **arctime** parameter indicates the minimum number of days a syslog record will remain in the archive file before being purged.

The **workspace** parameter specifies a directory the archiving program should use for temporary work files when archiving syslog files.

To change log facilities, issue the following command.

```
fwlog cmd=change
        index=Index
        [facility=Facility]
        [priority=Priority]
        [logfile=LogFileName]
        [arcfile=ArchiveFileName]
        [logtime=DaysToKeepInLog]
        [arctime=DaysToKeepInArchive]
        [workspace=WorkspaceDirectory]
```

If a change, particularly the initial instance, fails to create a syntactically correct configuration file (for example, the log file definition that was created has missing fields), a warning is issued and the firewall will not log data.

To perform logging but no archiving, only the **facility**, **priority**, and **logfile** parameters are required. To disable log archival once it is started, blank out the **logtime**, and **arctime** parameters. If you have scheduled an archival job, delete it.

To list the current log-file configuration data, issue the following command.

```
fwlog cmd=list
```

To delete the firewall log entry specified by the index number returned for the entry on the fwlog cmd=list command, issue the following command.

```
fwlog cmd=delete
      index=index of entry to delete
      force={yes|no}
```

Log Monitor

Use the log monitor command to tell the log monitor when and how to trigger alerts. Alerts occur when threshold values specified in this command (or the corresponding configuration client panel) are reached within a specified time interval. When an alert occurs:

1. A record is written to the firewall alerts facility and to the firewall logging facility
2. A specified command is run

3. A notice is sent to one or more user IDs
4. A message is sent to a paging device

The last three actions are controlled by proper configuration of values specified here.

Listing the Log Monitor Settings

```
fwlogmon cmd=list
```

Specifying User IDs to Receive Mail Notifications when any Alert Occurs

To specify user IDs to receive mail notifications when any alert occurs (the notice is sent to each ID you add):

```
fwlogmon cmd={add|delete}
         type=id
         username=
         [comment=]
```

Specifying a Command to be Run When Any Alert Occurs

```
fwlogmon cmd={add|change}
         type=command
         command=CommandToExecute
         [comment=]

fwlogmon cmd=delete
         type=command
```

Specifying a Threshold at Which an Alert Should be Triggered Based on the Number of Unsuccessful Login Attempts

```
fwlogmon cmd=add
         type={single|multi|host}
         count=NumberofFailures
         time=Time
         pager=Y|N
         [comment=]

fwlogmon cmd=change
         type={single|multi|host}
         [count=NumberofFailures]
         [time=time]
         [pager=Y|N]
         [comment=]

fwlogmon cmd=delete
         type={single|multi|host}
```

Specifying a Threshold at Which an Alert Should be Triggered Based on Number of Occurrences of a Specific Firewall Message ID

```
fwlogmon cmd=add
         type=msg
         tag=msgtag
         count=NumberofFailures
         time=time
         pager=Y|N
         [comment=]

fwlogmon cmd=change
         type=msg
         tag=msgtag
         [count=NumberofFailures]
         [time=time]
         [pager=Y|N]
         [comment=]
```

```
fwlogmon cmd=delete
         type=msg
         tag=msgtag
```

The parameter definitions are:

type Identifies the type of log monitor command characteristic being added or modified.

Allowed values are id, command, msg, single, multi, and host.

id Affects the user ID to send notices to.

command
Specifies a command to be executed.

msg Affects the monitoring of a specific log message.

single Affects monitoring based on single user IDs. A counter is kept for each ID that has a failed attempt. If the counter for any ID reaches the threshold value specified in this command, an alert is triggered.

multi Affects monitoring based on multiple user ids. If the total of all the counters, for all user ids that have had failed attempts, reaches the threshold value specified in this command, an alert is triggered.

host Affects monitoring based on host names. A counter is kept for each host name from which a failed attempt occurs. If the counter for any host name reaches the threshold value specified in this command, an alert is triggered.

username
The mail ID of a firewall administrator or other user to be notified of any alert. Alert notifications will be successfully mailed only if you have properly configured a secure-side mail server.

command
The name of the command to be executed when any alert occurs. It must be the full-path name of an executable file. It can be a .bat file, allowing multiple commands to be executed from within that file, however if the .bat file makes any reference to other files, they also must be full-path name references.

count Sets the threshold for the number of failures, or occurrences of a particular log message, at which an alert will be used.

time Sets a time-interval in minutes. The count must be reached within this interval of time from the first occurrence, in order for an event to be triggered. Occurrences older than this interval before the current time are dropped from the count.

pager Specifies whether you use a page or not, when the associated threshold triggers an alert. The active pager configuration is used to send the page.

tag A log message tag (with the message prefix ICA) to be monitored. Log monitor messages (ICA tags lower than 1000) cannot be monitored.

Mail

The Securemail SMTP proxy does not store and forward messages in order to provide higher levels of security and firewall reliability. In most cases it is desirable to have the store and forward activity occur on the native mail system and not on an intermediate server. However there are three conditions where it may be desirable to create a connection to an overflow server to handle processing which the proxy is not able to handle:

1. When the proxy receives a message it attempts to create connections to the outbound hosts when RCPT commands are received. As each new recipient (RCPT) command is received it either opens a new connection or reuses an existing connection. The opening of outbound connections is limited by a configurable MAX_FAN_OUT which is limited to 32 to keep a single message from dominating proxy and machine resources. When this limit is reached then if an overflow server is configured the recipients that do not fit into existing connections will be sent to the overflow server. Most messaging systems will not require this usage since a RCPT command issued to a recipient which would have gone to a non-configured overflow server will have a temporary error returned and the message should be retried for those recipients later. There are however some mail systems where the retry logic may not work transparently and it is desirable to off-load the processing to an overflow server. An alternative is to configure the mail system to limit the number of recipients per message to avoid attempting to go to the overflow server.
2. 2) The overflow server can serve as a store and forward server for queuing messages when the destination server is not available. With most messaging systems the temporary error returned as a response to the RCPT command when a host is known to DNS but is not available for a connection causes the message to be re-queued for later re-transmission. However for some messaging systems the re-queue is visible to the users as a protocol error and it is desirable to have the messages moved off the messaging system on top another server regardless of the success of the final delivery. Also while most messaging systems have reasonable queuing mechanisms there may be cases where it is preferable to have retransmission queuing occur at another server other than the messaging server in which case the overflow server can serve this purpose.
3. If a failure occurs during the transmission of the DATA segment of a message after the RCPT commands have flowed and responded to, then the overflow server can serve the function of receiving the message for retransmission. If no overflow server is installed then the message will be resent to all of the recipients which is normally not an issue with messaging systems since they usually contain code to detect and discard duplicate messages. However with some messaging systems it may be preferable to use an overflow server for these cases in particular for cases where large messages are routinely sent over unreliable lines.

There are some reasons why you would install an overflow server, and they are:

- Your messaging system has no ability to limit the number of recipients per message being sent outbound and does not tolerate temporary errors acceptably
- Your messaging system does not handle large queues or retransmission of messages when they can not be immediately delivered gracefully and you have another store and forward messaging component available
- Transmission of large messages over unreliable lines is causing duplicate messages frequently enough to justify having a fallback server

In general if your messaging system can tolerate and properly re-queue messages which are responded to with temporary error conditions then the installation of an overflow server is not required.

If you can avoid installing an overflow server, then you have the following advantages:

- Messages are only queued in the messaging system thus making message disposition and tracking questions less complicated
- Maintenance of queued messages outside of the messaging system is eliminated

There are three basic configurations for an overflow server:

- Use of the primary messaging system as the overflow server: The communication between components occurs on the standard port 25.

  Note: The primary messaging system must have the ability to delay the retransmission when messages are sent over the overflow path to stop mail loops.
- Use of a separate messaging component like sendmail on the firewall: The store and forward messaging component must listen on a non-standard port so as not to interfere with the proxy listening on port 25. Both the Proxy and the store and forward component are able to send outbound, but only the securemail proxy is able to receive. Filters should be set up to exclude traffic to the overflow port from the outside to avoid any security related issues with the store and forward component if sendmail is used for instance.

  This configuration has the advantage on not requiring another server, but has a potential for causing instability with the firewall if the store and forward queues are not isolated from causing disruption if the queuing space becomes full.
- Use of a separate messaging component on another server: The store and forward can either have the ability to send outbound directly as picture above, or it can tunnel the traffic back through the proxy (assuming that the store and forward component will not get into loops sending messages by being able to delay retransmission of messages where a host is temporarily not available).

  This configuration requires another server but has the advantage of not storing any content on the firewall itself and minimizing disruption of the firewall's operations.

Use the `fwsecuremail` command to modify the overflow server configuration. The `refresh` command must be used to trigger the server to re-read the configuration after changes are made.

```
fwsecuremail cmd=list

fwsecuremail cmd=list

fwsecuremail cmd=change
        [overflow_host]=
        [overflow_port]=

fwsecuremail cmd=refresh

fwsecuremail cmd=shutdown
```

The parameter definitions are:

overflow_host
: Can either be a host name or a dotted-decimal address enclosed in square brackets.

overflow_port
An integer. Overflow_host and overflow_port together identify the overflow server.

In the `fwsecuremail.cfg`, add these options:

- **HIDE_SECURE_NAMES** and the values supported by this option are:
  - Y: will hide your private domain from being exposed to the non-secure world by doing substitution of each domain found in the header which is in the list of secure domain names with the corresponding non-secure name.

    Note: The prior to this release the substitution was simple string substitution, but with this release the substitution occurs for all sub-domains with the domain name specified.
  - *N*: will not modify the header lines at all
  - *R*: lines containing the Private domain will be removed and all other occurences of the private domain names will be substituted
  - *A*: All received lines will get removed and private domain names will not be substituted to the non-secure world

    The option *A* works most closely to the original safemail design. If mail list servers or mail forwarding within your network could lead to mail loops then the *A* option is not recommended, but instead either the *R* option to remove all internally generated Received lines, or the *Y* option to hide the names but maintain the Received lines should be used.

    If the public and private domain names are the same then this option does not do any substitution but will still remove the Received lines with the *A* option set. To have no changes to the header set the option to *N*.
- **SOURCE_ROUTE_OVERFLOW** and the values supported by this option are:

  When mail is sent to Overflow server, some servers don't recognize the source route address syntax and return an error. The default value is option *N*.
  - *N*: Send the mail to the overflow server without the "@domain" source route syntax.
  - *O*: Send the mail to the overflow server by using the "@domain" syntax with destination domain.
  - *F*: Send the mail to the overflow server by using the "@domain" syntax with secure side domain

    The @ route or source routing feature of SMTP allows a mailer to specify that the normal routing for a mail domain be overridden. These three options allow the routing to proceed as normal (the *N* option), route the message back to the firewall (the *F* option), or route the message explicitly to the original domain (the *O* option).

    Normally you will set this option to *N* especially with default configurations for Domino SMTP MTA installations.
- **OVERFLOW_CODE**: and the value supported by this option is: Integer (0–99999). The default value is 452.

  When mail is sent to the overflow server by the Firewall, and the overflow server is unavailable or undefined, this code is returned to the source (secure side) mail server along with the overflow message indicating a temporary error. While the default value of 452 indicates a temporary error which should be retried, different mailers handle this type of error differently. This could has been made configurable to allow the interaction between the lack of an overflow server and the original mailer to minimize error conditions which are reported to the originators of messages.

- **OVERFLOW_MESSAGE**: Any string value is supported.

  When mail is sent to the overflow server by the Firewall, and the overflow server is unavailable or undefined, this message is returned to the source (secure side) mail server along with the overflow code indicating a temporary error using the error code defined above and the message defined in this message. This should allow tailoring of the message returned to inform users of what this error condition means. For some mailers this string will not be exposed, but for others could be used to explain that the message was not sent and is being requeued.
- **RECIPIENT_REWRITE**: and the values supported by this option are:
  - *N*: do not do domain substitution
  - *Y*: do domain substitution

    Indicates if the domains should be substituted in headers when the mail passes through the Firewall. Setting the option to *Y* will substitute the domain name (including sub-domains) in all interchanges including the RCPT command.

    Note: This can help with replies and not having to create aliases on the native secure mail systems, but could result in mis-directed mail if you have multiple local users with the secure network with the same local part but different domain names.

Network Address Translation

Use the `fwnat` command to configure Network Address Translation (NAT) on your firewall.

Note: The `fwnat` command is used if you do not wish to use the GUI.

There are four types of NAT configuration entries:

- Many-to-One Registered Address - Many-to-one translation involves dynamically translating a packet's IP address and port number such that many (up to 64512) internal hosts can share one registered IP address.
- Translate Secure IP Addresses - A translate entry, which is normally used in conjunction with a many-to-one entry, limits the addresses to be translated to a particular range.
- Exclude Secure IP Addresses - An exclude entry, which is normally used in conjunction with a many-to-one entry, limits the definition a set of secure network addresses that should not be translated.
- MAP Secure IP Address - A map secure IP address entry defines a one-to-one mapping from a secure IP address to a registered IP address. This one-to-one mapping allows non-secure clients to connect to machines behind the firewall without revealing the secure machine real IP address.

To add a many-to-one entry to the NAT configuration use **type=many-to-one**:

```
fwnat cmd=add
        type=many-to-one
        addr=Addr
        [timeout=minutes]
```

The parameter definitions are:

type=many-to-one
: Adds a `many-to-one` entry

addr=*Addr*
Registered IP address that secure addresses are translated into.

timeout=*minutes*
The number of minutes an address translation can remain idle before NAT can free the registered IP address and port. The default is 15 and the range is 5–45.

To modify a many-to-one entry in the NAT configuration use the following syntax:

```
fwnat cmd=change
        index=n
        [addr=Addr]
        [timeout=minutes]
```

The parameter definitions are:

index =*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific many-to-one NAT entry for the index parameter.

addr=*Addr*
Registered IP address that secure addresses are translated into.

timeout=*minutes*
the number of minutes an address translation can remain idle before NAT can free the registered IP address and port. The default is 15 and the range is 5–45.

To delete a many-to-one entry in the NAT configuration use the following syntax:

```
fwnat cmd=delete
        index=n
```

The parameter definition is:

index=*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific many-to-one NAT entry for the index parameter.

To add a translate entry to the NAT configuration use **type=translate** and to add an exclude entry to the NAT configuration use **type=exclude**:

```
fwnat cmd=add
        type={translate|exclude}
        addr=Addr
        mask=Mask
```

The parameter definitions are:

type=translate
Adds a `translate` entry

type=exclude
Adds an `exclude` entry

addr=*Addr*
IP address that identifies a range of secure IP addresses that require translation or require exclusion from translation.

mask=*Mask*
Identifies the width of the translated or excluded range.

To modify a translate or exclude entry in the NAT configuration use the following syntax:

```
fwnat cmd=change
        index=n
        [addr=Addr]
        [mask=Mask]
```

The parameter definitions are:

index=*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific translate or exclude NAT entry for the index parameter.

addr=*Addr*
IP address that identifies a range of secure IP addresses that require translation or exclusion from translation.

mask=*Mask*
Identifies the width of the translated or excluded range.

To delete a translate or exclude entry in the NAT configuration use the following syntax:

```
fwnat cmd=delete
        index=n
```

The parameter definition is:

index=*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific translate or exclude NAT entry for the index parameter.

To add a map entry to the NAT configuration use **type=map**:

```
fwnat cmd=add
      type=map
      secaddr=SecureAddr
      remaddr=RegisteredAddr
```

The parameter definitions are:

type=map
Adds a `map` entry.

secaddr
Secure IP address that should be translated into a specified registered address.

remaddr
Registered IP address into which the specified secure IP address should be translated.

To modify a map entry in the NAT configuration use the following syntax:

```
fwnat cmd=change
      index=n
      [secaddr=SecureAddr]
      [remaddr=RegisteredAddr]
```

The parameter definitions are:

index=*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific map NAT entry for the index parameter.

secaddr
Secure IP address that should be translated into a specified registered address.

remaddr
Registered address into which the specified secure address should be translated.

To delete a map entry in the NAT configuration use the following syntax:

```
fwnat cmd=delete
       index=n
```

The parameter definition is:

index=*n*
When you execute `fwnat cmd=list`, there are numbers in the left-hand column for specific NAT entries. Use the number for your specific map NAT entry for the index parameter.

The syntax of the `fwnat` commands that require no further parameters are as follows:

```
fwnat  cmd={list | update | verify |shutdown | startlog | stoplog}
```

The parameter definitions are:

fwnat cmd=list
Lists current NAT configuration. The listed configuration may or may not be active.

fwnat cmd=update
Activates current NAT configuration.

fwnat cmd=verify
Checks the syntax of the configuration.

fwnat cmd=shutdown
Stops all address translation.

fwnat cmd=startlog
Starts NAT logging.

fwnat cmd=stoplog
Stops NAT logging.

Paging

You can activate pager notification support to have the firewall page a system administrator by sending a message to the administrator's beeper when there are intrusion alerts on the firewall. For this to work properly, you must configure the pager, the carrier service, and a modem using the `fwpgr`, `fwcarrier`, and the `fwmodem` commands.

Pager Configuration

The fwpgr command sets up parameters for your active pager, the one that the Firewall will signal.

To list a pager, issue the following command.

```
fwpgr cmd=list
```

To add a pager, issue the following command.

```
fwpgr cmd=add
        carrier=
        modem=
        type=
        priority=
        pagerid=
        message=
```

To modify pager parameters, issue the following command.

```
fwpgr cmd=change
        [carrier=]
        [modem=]
        [type=]
        [priority]
        [pagerid=]
        [message=]
```

The parameter definitions are:

carrier A name for the carrier service, as defined in the carriers database (through the fwcarrier command).

modem
The same value as the filename parameter of the fwmodem command.

type Specify either numeric or alpha.

priority
Enter a priority for sending a page. The highest priority is 5 and the lowest priority is -1.

pagerid
The carrier-assigned, unique identifying number or name for your paging device.

message
The message to be sent to and displayed on the paging device. Either a number or text, depending on the service your carrier is providing. It will be truncated if it exceeds the smaller of the length setting for the carrier or 200 characters.

Carrier

Use the fwcarrier command to set up parameters for any paging services you use.

To list a carrier, issue the following command.

```
fwcarrier cmd=list
          carrier=
```

To add a carrier, issue the following command.

```
fwcarrier cmd=add
          carrier=
          dial=
          nid=
          dtmf=
          digits=
          blocks=
          trans=
          length=
          baud=
          parity=
          databits=
          stopbits=
```

To modify carrier parameters, issue the following command.

```
fwcarrier cmd=change
          carrier=
          [dial=]
          [nid=]
          [dtmf]
          [digits=]
          [blocks=]
          [trans=]
          [length=]
          [baud]
          [parity=]
          [databits=]
          [stopbits=]
```

To delete a carrier, issue the following command.

```
fwcarrier cmd=delete
          carrier=
```

The parameter definitions are:

carrier The name of the carrier.

dial Must specify the carrier's modem phone number for the TAP service for which you have contracted.

nid Determines whether or not the paging carrier allows numeric IDs to be used during a data connection. Specify Yes for numeric pagers or No for alphanumeric pagers.

digits Specify the maximum number of digits for the alphanumeric pager.

blocks Specify the maximum blocks per transaction.

trans Specify the maximum transactions per call.

length The maximum message length permitted by your carrier's service.

baud Specify the most reliable baud rate supported by your carrier's service.

parity The type of parity checking supported by your carrier's service. This is usually even parity for the TAP protocol.

databits
The number of data bits supported by your carrier's service. This is usually 7 for the TAP protocol.

stopbits
The number of stop bits supported by your carrier's service. This is usually 1 for the TAP protocol.

Modem Configuration

To set up pager notification support, you need to configure your modem.

Use the modem command to configure a modem for sending pager requests to your pager carrier.

To list a modem, issue the following command.

```
fwmodem cmd=list
        filename=
```

To add a modem, issue the following command.

```
fwmodem cmd=add
        modem=
        filename=
        cmdstring=
        cmdterm=
        dialcmd=
        dialpause=
        dialpound=
        dialstar=
        return=
        cmdresp=
        connresp=
        localecho=
        baud=
        databits=
        stopbits=
        parity=
        default=
        initstring=
        outsideline=
        hangup=
```

To modify modem parameters, issue the following command.

```
fwmodem cmd=change
        modem=
        filename=
        [cmdstring=]
        [cmdterm=]
        [dialcmd=]
        [dialpause=]
        [dialpound=]
        [dialstar=]
        [return=]
        [cmdresp]
        [connresp=]
        [localecho=]
        [baud=]
        [databits=]
        [stopbits=]
        [parity=]
        [default=]
        [initstring=]
        [outsideline=]
        [hangup=]
```

To delete a modem, issue the following command.

```
fwmodem cmd=delete
        filename=
```

The parameter definitions are:

modem
A name for the modem file.

filename
Specify the modem filename. This must end with a .modem extension.

cmdstring
Specify the command mode string. The command mode string contains the set of characters that should be sent while in connect mode. This forces the modem into command mode without hanging up.

cmdterm
Specify the command terminator. The command terminator indicates the character that should be appended to the end of all command sequences to force the modem to accept the command.

dialcmd
Specify the dial command. This is the command sent to the modem in command mode. ATDT works for most modems.

dialpause
Specify the character used in a dial string to force your modem to wait for a short period of time (about 1 second) before continuing with the dial string. This is normally a comma.

dialpound
Specify the character used in a dial string to force your modem to dial the touch tone corresponding to the # sign. This is normally the pound (#) sign.

dialstar
Specify the character used in a dial string to force your modem to dial the touch tone corresponding to the * sign. This is normally the asterisk (*) sign.

return Specify the character to append the dial string in order to force the modem back into command mode after completing the dial string. The semicolon works with most modems.

cmdresp
Specify the string that allows your modem to accept commands. Normally, OK works.

connresp
Specify the string that your modem will output when your carrier has been detected and a connection has been made. Most modems use CONNECT.

localecho
Specify Yes if you want the modem to echo local characters while in connect mode.

baud Specify the baud rate for the modem.

databits
Specify the data bits for the modem.

stopbits
Specify the stop bits for the modem.

parity Specify the parity for the modem.

default
Specify the default device for the modem. This device file must exist under the /dev directory and should match with your configured serial port.

initstring
The initialization string for the modem. Parameters in the string must be suitable for an AT modem command, but the AT should not be included as part of the string. Parameters specified should be coordinated with the communications requirements of your carrier's modem.

outsideline
The number to dial to get an outside line.

hangup
Specify the command to force your modem to hang-up after dialing. The default that works well with most modems is ATH0.

Testing Pager Configuration

To ensure that you have correctly configured your active pager, you can type fwsendpage at a command prompt.

The parameter definitions are identical to those for the fwpgr command.

Multiple Pagers

If you have need to regularly change your active pager, do the following:

- Make sure you have defined all the needed carriers and modems
- Use fwpgr or the configuration client to define and save a pager configuration
- Copy the etc/config/fwcust.pager file, giving it a name you can recognize
- Define another pager configuration and copy it and so on until you have copies of all the fwcust.pager files you need
- Copy the configuration file you want to activate back to etc/config/fwcust.pager

If you are trying to handle shift changes, set up an AIX cron job to automatically repeat the last bullet at the start of each shift.

Tunnels

The fwtunnl command is used to list, add, change, delete, import, export, activate, deactivate, and shutdown tunnels.

To display all tunnels from the tunnel context files, issue the following command.

```
fwtunnl cmd=list
        [directory=<import_directory_full_path>]
        [tunnel=tunnel_id1,tunnel_id2,...,tunnel_idn]

The following command produces this output:
         tunnel  =  1
      tunnelname =  MyTunnel
           type  =  2
        remaddr =  9.37.53.82
           addr = 10.0.0.1
     encrypthow =  CDMF
        policy  =  be
      timeout   =  480
```

```
       localspi  =  262
      remotespi  =  500
     algorithm   =  HMAC_SHA
   localuseraddr = 10.0.0.1
   localusermask =  255.255.255.0
  remoteuseraddr =  9.37.51.219
  remoteusermask =  255.255.240.0
      filtertype =  1
          replay =  0
    encryptmac  =  HMAC_MD5
   activestatus  =  0
```

To add a tunnel definition to the tunnel context files, for tunnel **type=manual**, issue the following command.

```
fwtunnl cmd=add
        [type={manual}]       (default=manual)
        [tunnelname=<tunnel name>]    (default=blank)
        remotespi= {256-999999}
        remaddr=<a.a.a.a>
        addr=<a.a.a.a>
        [encrypthow={CDMF|DES_CBC|3 DES_CBC|NULL}] (default=CDMF)
        [encryptmac={HMAC_MD5|HMAC_SHA|NONE}]  (default=HMAC_MD5)
        [timeout={1-99999}]    (default=480)
        [policy={be|e|a}]      (default=be)
        [algorithm={HMAC_DM5|HMAC_SHA}] (default=HMAC_MD5)
        [filtertype={0 (static)| 1 (dynamic)}] (default=0)
        [localuseraddr=<a.a.a.a>]  (required if filtertype=1)
        [localusermask=<m.m.m.m>] (required if filtertype=1)
        [remoteuseraddr=<a.a.a.a>] (required if filtertype=1)
        [remoteusermask=<m.m.m.m>]  (required if filtertype=1)
        replay=[{0 | 1}]
        refresh={1-720}
```

To modify a specified tunnel, for tunnel **type=manual**, issue the following command.

```
fwtunnl cmd=change
        tunnel=tunnel_id
        [type={manual}]
        [tunnelname=<tunnel name>]
        [remotespi={256-999999}]
        [remaddr=<a.a.a.a>]
        [addr=<a.a.a.a>]
        [encrypthow={CDMF|DES_CBC| 3 DES_CBC|NULL}]
        [encryptmac={HMAC_MD5 | HMAC_SHA}]
        [timeout={1-99999}]
        [policy={be|e|a}]
        [algorithm={HMAC_MD5|HMAC_SHA}]
        [filtertype= {0(static) | 1(dynamic)}]
        [localuseraddr=<a.a.a.a>]
        [localusermask=<m.m.m.m>]
        [remoteuseraddr=<a.a.a.a>]
        [remoteusermask=<m.m.m.m>]
        [replay={0|1}]
        [refresh={1-720}]
```

To delete a specified tunnel, issue the following command.

```
fwtunnl cmd=delete
        tunnel={tunnel_id1,tunnel_id2,...,tunnel_idn}
```

To import tunnel from the export file in the given directory, issue the following command. The export file name is `ipsec_tun_manu.exp`.

```
fwtunnl cmd=import
        directory=<import_directory_full_path>
        tunnel={tunnel_id1,tunnel_id2,...,tunnel_idn}
```

To export a tunnel(s) to the given directory, issue the following command. The export file name is `ipsec_tun_manu_exp`.

```
fwtunnl cmd=export
        directory=<export_directory_full_path>
        tunnel={tunnel_id1,tunnel_id2,...,tunnel_idn}
        overwrite={0 (no) | 1 (yes)}
```

If there is an existing export file then it will be overwritten.

To activate or deactivate the specified tunnel, issue the following command.

```
fwtunnl cmd={activate|deactivate}
        [tunnel={tunnel_id1,tunnel_id2,...,tunnel_idn}| all]
```

To shutdown all active tunnels, issue the following command.

```
fwtunnl cmd=shutdown
```

The parameter definitions are:

tunnel Specify the ID of the tunnel. This is assigned by the Firewall and you cannot set or change this value.

tunnelname
Specify the name of the tunnel.

type Specify the type of tunnel. It is always a manual tunnel and you cannot set or change this value.

remaddr
Specify the IP address of the remote tunnel to be used by the tunnel.

addr Specify the IP address of the local firewall interface to be used by the tunnel.

encrypthow
Specify the algorithm used for IP packet encryption. The values are either CDMF, DES_CBC, 3DES_CBC, or NULL. If you specify none, you cannot also specify none for **Authentication Algorithm (ESP).**

policy A combination of encryption and authentication values. The values are either AH only, ESP only, or ESP/AH.

timeout
The time in minutes that a tunnel will be operational. The default is 480 (8 hours) and the maximum time allowed is 99999. If you specify 0, the tunnel will not time out; the lifetime is unlimited.

local spi
Specify the Firewall security parameter index which is assigned by the firewall when you add a tunnel. You cannot set or change this value. All SPIs are 32-bit random numbers. It will use this value to locate the security agreement properties for inbound IPSec datagrams addressed to itself.

remote spi
Specify the security parameter index (SPI) value the tunnel owner will insert into outbound IPSec-protected datagrams that it sends to the tunnel partner. It is usually agreed upon by you and the tunnel partner. This value can be entered in decimal format and must be greater than 255.

algorithm
Specify Authentication Header (AH) authentication algorithm which is used for IP packet authentication. HMAC_MD5 or HMAC_SHA are the types available.

localuseraddr
Specify the local host IP addresses of which datagrams sent to or received from the remote host through the tunnel.

localusermask
Specify the mask of the local host IP address.

remoteuseraddr
Specify the remote host IP addresses of which datagrams sent to or received from the local host through the tunnel.

remoteusermask
Specify the mask of the remote host IP address.

filtertype
Specify the type of the filter which is either **static** or **dynamic**. If you specify **static**, you must create the tunnels filter rules yourself. If you specify **dynamic**, the Firewall will generate dynamic filters each time the tunnel is activated. Specifying dynamic filters allows all supported protocols on any port through the specified tunnel.

If you specify the dynamic filters type, you are required to specify the local and remote user addresses.

replay Specify replay prevention which uses a sequence counter to prevent old packets from being replayed as a form of attack. The firewall tunnel will always send out replay prevention information in the packet. This is always zero. You cannot set or change this value.

encryptmac (ESP)
Specify the Encapsulating Security Payload authentication algorithm which is used for IP packet authentication. The values are HMAC_MD5, HMAC_SHA, or none. If you specify none, you cannot also specify none for **Encryption Algorithm**.

activestatus
Specify the status of the Tunnel either inactive (0) or active (1).

Users

This command adds a new user or modifies one or more attributes of an existing firewall user. All parameters either have default values or are unnecessary in certain circumstances. For `cmd=add`, default values will be stored; for `cmd=change`, the existing values will be preserved.

```
fwuser cmd={add|change}
       username=LoginName
       [fullname="UsersRealName"]
       [password={yes|no}]
       [pwdvalue=Password]
       [level={proxy|admin}]
       [secshell=SecureShell]
       [remshell=NonSecureShell]
       [loclogin=LocalLoginAuthentication]
       [secftp=SecureFTPauthentication]
       [remftp=NonSecureFTPauthentication]
       [secauth=SecureTelnetAuthentication]
       [remauth=NonSecureTelnetAuthentication]
```

```
[remip=NonSecureIPSecClientAuthentication]
[secadmin=SecureAdminAuthentication]
[remadmin=NonSecureAdminAuthentication]
[warntime=IdleWarningTime]
[disctime=IdleDisconnectTime]
[histexpire=HistoryExpiration]
[histsize=HistorySize]
[loginretries=LoginRetries]
[maxage=MaxAge]
[maxexpired=MaxExpiredAge]
[maxrepeats=MaxRepeatChars]
[minalpha=MinAlphaChars]
[mindiff=MinDifferentChars]
[minlen=MinLength]
[minother=MinNonAlphaChars]
[pwdwarntime=PasswordWarnTime]
[modeallowed=host|none]
[fg_act={yes|no}]
[fg_addrtrans={yes|no}]
[fg_all={yes|no}]
[fg_clone={yes|no}]
[fg_dist={yes|no}]
[fg_dns={yes|no}]
[fg_interfaces={yes|no}]
[fg_logmonitor={yes|no}]
[fg_logs={yes|no}]
[fg_mail={yes|no}]
[fg_netobjs1={yes|no}]
[fg_netobjs2={yes|no}]
[fg_pagers={yes|no}]
[fg_proxyserver={yes|no}]
[fg_secag={yes|no}]
[fg_sesslfm={yes|no}]
[fg_snmp={yes|no}]
[fg_user={yes|no}]
[fg_traffic={yes|no}]
[fg_vpn={yes|no}]
```

Fundamental Parameters

username
Login name for this user. Must be a valid AIX login name.

fullname
User's full name, or some other brief (one-line) information pertaining to this user. If spaces are to be included in this value, the value must be enclosed in double-quotes.

level The default value is proxy, which indicates that the user being created is a simple proxy or Socks user. Administration function groups and administration authentications do not apply to proxy users.

Login Shells

secshell
Shell to use for telnet logins from a secure interface. Valid values are /bin/restrict.sh, /bin/csh, /bin/ksh, /bin/bsh, and /bin/oneact.sh. The default is /bin/restrict.sh.

remshell
Shell to use for telnet logins from a nonsecure interface. Valid values are /bin/restrict.sh, /bin/csh, /bin/ksh, /bin/bsh, and /bin/oneact.sh. The default is /bin/restrict.sh.

Authentications

Following are authentication strings and their corresponding authentication methods. Use of the authentication strings for the various parameters of the `fwuser` command is indicated below.

- permit–permit all
- deny–deny all
- password–Firewall password
- sdi–SDI
- user_defined–user-supplied authentication

loclogin
Authentication method for logins from the local console. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

secftp Authentication method for FTP logins from a secure interface. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

remftp
Authentication method for FTP logins from a nonsecure interace. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

secauth
Authentication method for telnet logins from a secure interface. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

remauth
Authentication method for telnet logins from a nonsecure interface. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

remip Authentication method for Remote IPSec Client logins from a nonsecure interface. Valid values are deny, none, password, sdi, and user_defined. The default is deny.

secadmin
Authentication method for Firewall Configuration Client logins from a secure interface. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

remadmin
Authentication method for Firewall Configuration Client logins from a nonsecure interface. Valid values are deny, permit, password, sdi, and user_defined. The default is deny.

Note: `fwdfuser` cannot have Firewall Password set on any of its authentication method fields.

Idle Proxy Parameters

warntime
Idle time in minutes after which the fwidleout command will warn this user about a forthcoming disconnection.

disctime
Idle time in minutes after which the fwidleout command will disconnect this user. Disctime should be greater than warntime.

Firewall Password Parameters

password
Indicates if a user will be prompted for a password. By default, you will be prompted if any authentication method is specified or allowed to default to password.

pwdvalue
Used mostly for script programming, this parameter allows the value of a parameter to be specified on the command line. Note that this value is entered in clear text and is not obscured from eavesdroppers. There is no default.

histexpire
Defines the period of time (in weeks) that a user cannot reuse a password. The value is an integer string. The valid values are 0 - 52. The value of 0 indicates no time limit is set. The default value is 0.

histsize
Defines the number of previous passwords a user cannot reuse. The value is an integer string. The valid values are 0 - 20. Only valid if `histexpire=0`. The default value is 5.

loginretries
Defines the number of unsuccessful login attempts allowed after the last successful login before the system locks the account. The value is an integer string. The valid values are 0 - 20. The default value is 10. A zero or negative value indicates that no limit exists. Once the user's account is locked, the user will not be able to log in until the system administrator resets the user's unsuccessful_login_count attribute in the /etc/security/lastlog file to be less than the value of login retires. To do this, enter the following,

```
chsec -f /etc/security/lastlog -s username -a unsuccessful_login_count=<value>
```

maxage
Defines the maximum age (in weeks) of a password. The password must be changed by this time. The value is an integer string. The valid values are 0 - 52. The value of 0 indicates no maximum age. The default is 13.

maxexpired
Defines the maximum time (in weeks) beyond the maxage value that a user can change an expired password. After this defined time, only an administrative user can change the password. The value is an integer string. The valid values are -1 - 26. If the maxexpired attribute is 0, the password expires when the maxage value is met. If the maxage attribute is 0, the maxexpired attribute is ignored. The default is 3.

maxrepeats
Defines the maximum number of times a character can be repeated in a new password. The valid values are 0 - 8, but a value of 0 is meaningless. The value of 8 indicates that there is not a maximum number. The default is 2.

minalpha
Defines the minimum number of alphabetic characters that must be in a new password. The value is an integer string. The valid values are 0 - 8. The value of 0 indicates no minimum number. The default is 4.

mindiff
Defines the minimum number of characters required in a new password

that were not in the old password. The value is an integer string. The valid values are 0 - 8. The value of 0 indicates no minimum number. The default is 3.

minlen
Defines the minimum length of a password. The value is an integer string. The valid values are 0 - 8. The value of 0 indicates no minimum number. The default is 8.

minother
Defines the minimum number of non-alphabetic characters that must be in a new password. The value is an integer string. The valid values are 0 - 8. The value of 0 indicates no minimum number. The default is 1.

pwdwarntime
Defines the number of days before the system issues a warning that a password change is required. The value is an integer string. The valid values are 0 - 30. A zero or negative value indicates that no message is issued. The default value is 5.

Administration Functional Groups

modeallowed indicates the login modes allowed:

- none–User is not allowed to login to the firewall configuration server
- efm–Administrator can login in EFM mode
- host–Administrator can login to the firewall configuration server host mode only.
- both–Administrator can login in either EFM mode or Host mode

fg_all Enter yes if this administrator is allowed to administer all aspects of the firewall. The default is no.

fg_act Enter yes if this administrator is allowed to activate changes on a managed firewall. The default is no.

fg_addrtrans
Enter yes if this administrator is allowed to administer network address translation. The default is no.

fg_clone
Enter yes if this administrator is allowed to clone a managed firewall. The default is no.

fg_dist
Enter yes if this administrator is allowed to transmit configuration changes to a managed firewall. The default is no.

fg_dns
Enter yes if this administrator is allowed to administer Domain Name Services. The default is no.

fg_interfaces
Enter yes if this administrator is allowed to define firewall interfaces. The default is no.

fg_logmonitor
Enter yes if this administrator is allowed to administer Log Monitor thresholds. The default is no.

fg_logs
Enter yes if this administrator is allowed to administer Log Facilities. The default is no.

fg_mail
Enter yes if this administrator is allowed to administer the firewall mail gateway. The default is no.

fg_netobjs1
Enter yes if this administrator is allowed to perform basic administration of Network Objects. The default is no.

fg_netobjs2
Enter yes if this administrator is allowed to perform advanced administration of Network Objects. The default is no.

fg_pagers
Enter yes if this administrator is allowed to administer Pager Setup. The default is no.

fg_proxyserver
Enter yes if this administrator is allowed to configure the firewall proxy daemons. The default is no.

fg_secag
Enter yes if this administrator is allowed to administer a managed Firewall's Security Agreement. The default is no.

fg_sesslfm
Enter yes if this administrator is allowed to administer a managed Firewall's session limits. The default is no.

fg_snmp
Enter yes if this administrator is allowed to administer SNMP managers and subagent. The default is no.

fg_traffic
Enter yes if this administrator is allowed to administer Traffic Control. The default is no.

fg_user
Enter yes if this administrator is allowed to administer firewall users. The default is no.

fg_vpn
Enter yes if this administrator is allowed to administer Virtual Private Networks. The default is no.

To list all attributes of all firewall users or of a single specified firewall user:

```
fwuser cmd=list
       [username=username]
       [type={short|long}]
```

type={short|long}
The default for type is long if you use a username. If you do not use a username, the default is short.

To remove a user from the firewall:

```
fwuser cmd=delete
username=username
```

Chapter 2. Using Report Utilities

This chapter discusses using the report utilities of the IBM SecureWay Firewall. The primary purpose of the report utilities is to generate tabulated files of administrative information from **firewall log** files.

Tabulated text files can be generated and imported into tables in a database system, such as DB2® . The administrator can then use the Structured Query Language (SQL) to query the data and generate reports. The utilities also allow the administrator to create a readable text file of the firewall log messages.

Report utilities consist of the following programs and files:

fwar2asc
: Program to extract firewall log files from an archive library

fwlogtxt
: Program to generate full-text messages from a firewall log file

fwlogtbl
: Program to generate database import files, in DEL (delimited) format, from a firewall log and an su log.

  To use the fwlogtbl program and the DDL, DML, and DEL files, you should have some knowledge of relational databases and the use of an appropriate relational database product.

fwschema.ddl
: File of SQL Data Definition Language (DDL) statements, suitable for defining the database tables

fwimport.dat
: File of DB2 import statements, suitable for importing the DEL files into the database tables

fwqrysmp.dml
: File of SQL Data Manipulation Language (DML) statements, suitable for generating sample reports

The DDL and DML files are specific to the DB2 family, but can be modified for use with other database management systems. DEL format files can be readily imported (loaded) into DB2 and other database and file systems. Their simple format should allow conversion to other formats, if necessary.

In addition to processing the firewall log file, the administrator can use the utilities to process the AIX su log file (usually **/var/adm/sulog**). This file contains information about attempted uses of the AIX su command. Logged-in users use the AIX su command to switch to a different user ID, potentially acquiring greater authority. Both successful and unsuccessful attempts are logged. The result of processing the su log file is a tabulated file that can be imported into a database system.

Note: Do not use report utilities to process a log from the IBM Firewall for Windows NT. Only use the IBM Firewall for Windows NT report utilities to process a log from the IBM Firewall for Windows NT.

Report Utilities Usage

This information explains how to use report utilities from the command line. Refer to the *IBM SecureWay Firewall User's Guide* for information on using the report utilities from the configuration client.

To view the firewall log file from the command line, use the **fwlogtxt** utility. See "Generating Messages from the Firewall Log File" for more information.

To generate reports based on log information:

1. Install the relational database product.
2. Create an empty database.
3. Create empty firewall log tables in the database.
4. To produce the tabulated files, run **fwlogtbl** from the command line.
5. Import the resulting files to populate the database tables with log data.
6. Produce reports by running SQL statements or SQL programs.

Note: The first three steps need to be done once, while the remaining steps are repeated each time new log data is available.

IBM Firewall Log Format

Each entry of the firewall log file has the format:

```
Date Time firewall_name:year;pid:msg_num; msg_ID;var_1;...;var_n;
```

where

- The first three fields, **date, time, and firewall-name** are added by syslog.
- **year** is the four-character year.
- **pid** is the AIX process ID to which the entry applies.
- **msg_num** is a sequential integer which the Report Utilities use to access the appropriate, translated message text from the fw_log.cat file.
- **msg_ID** is the external number of the message (such as ICA0001e).
- **var_1-n** represent the values of message variables, where **n** is the number of variables in the message definition.

Note: Do not direct other syslog records to the same file as the firewall log. Such records will not conform to the format required by the report utilities and results are not predictable.

Generating Messages from the Firewall Log File

Use the command **fwlogtxt** to generate readable messages from the entries of a firewall log file.

The parameters include:

input Standard input from a firewall log file

output
Standard output

fwlogtxt syntax

```
fwlogtxt
```

Example:

```
fwlogtxt < fw980212.log >logtxt.out
fwlogtxt < fw980212.log | grep ICA31
tail -f /var/adm/messages | fwlogtxt
```

There are no parameters for fwlogtxt; it takes information from the standard input and puts results to the standard output.

Note that the second example filters the output to show full text of only those messages that start with 'ICA31'. Additional of filtering can be done using standard AIX facilities or user-provided scripts/programs. The third example of invocation (tail -f) permits dynamic monitoring of an active log and could also be filtered.

Extracting Firewall Log Files

Use the command **fwar2asc** to extract the named files from an archive library file into an ASCII file. The resulting ASCII file can be used as an input for both fwlogtxt and fwlogtbl. The archive library file is assumed to be in the format generated by Log File Management (the fwlogmgmt command). That is, the archived logs are compressed and end in '.Z'

fwar2asc syntax

```
fwar2asc [-f OutFile] ArchiveFile LogName
```

Example:

```
fwar2asc -f myFwLog myFwLogs.a 961113fwLog.Z
fwar2asc myFwLogs.a 961113fwLog.Z
```

-f **-f** is AIX syntax.

OutFile
Specifies the directory and file name of the output ASCII file. The default directory is the current directory. The default file name is the same as the value of the LogName parameter, but without terminating '.Z'.

ArchiveFile
Specifies the directory and file name of the input archive library file.

LogName
Specifies the name of the log file the user wants to extract from the archive library file. This will most likely end in '.Z' since the archived logs are compressed.

Generating Database Import Files

Use the command **fwlogtbl** to create, write over, or append to the tabulated files from which the user can populate the database tables for report generation.

The parameters include:

input Firewall log file, for example one extracted from a log archive library file using fwar2asc. -w, -a, and -su are parameter options.

output

File names:

a_alert.tbl
f_rule.tbl
f_info.tbl
f_match.tbl
f_stat.tbl
nat_info.tbl
nat_map.tbl
p_info.tbl
p_ftp.tbl
p_http.tbl
p_login.tbl
p_stat.tbl
srv_info.tbl
session.tbl
s_ftp.tbl
s_info.tbl
ssl_info.tbl
su.tbl

Only if [-su] is supplied

t_cntxt.tbl
t_policy.tbl
t_stat.tbl
pgr_info.tbl
mail_trk.tbl
efm_info.tbl

fwlogtbl syntax

```
fwlogtbl  -w [-d OutDir]  [-su]LogName
           |
          -a
```

Example:

```
fwlogtbl -a  -d /u/tai/fw/reports  fw961031.log
```

-w Specifies that the existing output file should be replaced. If the file does not exist, fwlogtbl creates it.

-a Specifies that the file generated should be appended to the existing output file. If the file does not exist, fwlogtbl creates it.

-d Identifies the output directory.

OutDir

Specifies the directory in which all the output files are to be stored. If no directory is specified, the output files will be stored in the current directory.

-su Specifies that the LogName is the name of an AIX su log file.

LogName

Specifies a firewall log file or an AIX su log file.

The output file names are predefined but can be copied or renamed after running fwlogtbl. The output files have delimited ASCII (DEL) file format, with no character string delimiters, and use semicolon (;) as the column delimiters.

Using a Database with Report Utilities

This section describes files provided with the firewall for creating the database, importing information into the database, and querying reports. If you have DB2, the db2 command can be used with these files. (Functions similar to the db2 command might exist in other database managers. The files may require alteration to be used with such functions.)

To run the db2 command, you must have DB2 installed and an instance defined. See the DB2 install documentation. Initially, you must use DB2's create database command to create an empty database. (We suggest calling it *fwlog*). To do this, type at the command line:

```
db2 create database fwlog
```

You must then connect to fwlog:

```
db2 connect to fwlog
```

The -vf options of the db2 command can then be used as follows:

```
db2 -vf fwschema.ddl > schema.out
db2 -vf fwimport.dat > import.out
db2 -vf fwqrysmp.dml > report.out
```

These steps are described in more detail in the following sections. In each case, the user should carefully check the standard output (redirected to a file in each of the examples). For import, it is also necessary to check the .msg file produced by each individual import statement.

Creating the Tables

The command **db2 -vf fwschema.ddl > schema.out** creates all the tables and indexes needed. Issue this command once, preferably soon after installing the firewall. The current user ID at the time this example is run will be the creator ID of the tables. This ID may need to be used as a table name qualifier (such as creatorid.tableName) in later SQL statements, unless they are run under the creator's ID. Thus, if not using the creator's ID, the user will need to edit the fwimport.dat and fwqrysmp.dml files to place the creator ID in front of each table name.

The `/usr/lpp/FW/sample/fwschema.ddl` file contains the DDL statements to create the database tables needed to accept records from the tabulated files created by fwlogtbl. You should look at schema.out to determine if your operation was successful. The statements in `fwschema.ddl` file can be used as is or can be modified to work with various database systems. (Users should not change table and column names.)

Importing the Data

The command **db2 –vf fwimport.dat > import.out** loads data from all the DEL files into the tables created by the **db2-vf fwschema.ddl** command.

The `/usr/lpp/FW/sample/fwimport.dat` file contains sample statements for importing the data from the *.tbl files into the DB2 database. As mentioned in

"Creating the Tables" on page 51, if the user of the imports is not the creator of the tables, the creator ID must be placed in front of each table name.

Each import statement produces information in standard out and additional information in a `tblname.msg` file, where tblname is specific to each import statement. The user should check both forms of output to determine if the import was successful. When running all the import statements in this file with a program such as DB2, the user should direct standard out to a file, then check that file and each of the .msg files. Each one of the import commands produces a separate .msg file. Also, the user should re-issue the **db2 –vf fwimport.dat > import.out** command whenever they have a new log to reflect in the database.

When importing large log files you might receive SQL error codes with descriptions indicating the need for more memory or disk space. For example, the message might be `insufficient heap space` or `transaction log space`. These errors require adjustment of the parameter settings for the database product or for the fwlog database. See the DB2 documentation for more information. A temporary alternative to adjusting the DB2 parameter settings is to split large logs or large tabulated files into smaller files.

Running Sample Queries

The **db2 -vf fwqrysmp.dml > report.out** command runs the sample queries. The fwqrysmp.dml file, `/usr/lpp/FW/sample/fwqrysmp.dml`, contains sample SQL statements that can provide useful report data, based on some of the query requirements. You can build on these examples to create your own reports. As mentioned in "Creating the Tables" on page 51, if the user of the imports is not the creator of the tables, the creator ID must be placed in front of each table name.

When running queries from the command line, DB2 allocates the maximum space it might need for each output column. This can result in a report that is difficult to read. You might achieve more satisfactory results by requesting fewer columns in each query or by imbedding these query statements in a program where you can better control the presentation.

User Interface into Report Utilities

Report Utilities are installed as part of the firewall installation. They can also be separately installed and run on a non-firewall host. The configuration client or the `fwlogtbl` command can be used to run report utilities on the firewall. On a non-firewall machine, use the command line.

The SQL Tables

This section defines the layout of the SQL tables.

Each firewall log message or AIX su log message is mapped to one of the following SQL tables:

```
ADMIN_ALERT
FILTER_INFO
FILTER_MATCH
FILTER_ACTIVE_RULE
FILTER_STATUS
NAT_INFO
NAT_MAP
PAGER_INFO
```

```
PROXY_FTP
EFM_INFO
MAIL_TRACK
PROXY_HTTP
PROXY_INFO
PROXY_LOGIN
PROXY_STATUS
SERVER_INFO
SESSION
SOCKS_FTP
SOCKS_INFO
SSL_INFO
SU
TUNNEL_CONTEXT
TUNNEL_STATUS
TUNNEL_POLICY
```

You should not change the table and column names. However, you can increase the width of a char column if you find that some of its values are being truncated.

Indexes

A log record representing a particular firewall event should appear only once in the database. If an administrator imports the same tabulated file multiple times or if another tabulated file derived from the same log file is imported, a log record could appear more than once.

To help avoid this problem, the database definition sample file, fwschema.dll, defines a unique index on each of the tables using these three fields:

- Filename of the log file that was the source of this record (LOG_FILE)
- The line number of this record in that log file (LINE_NUM)
- The repetition number for this line, based on the syslog 'last message repeated n times' message (REPEAT_NUM)

This index prevents you from loading the same line number from the same named file more than once. This, combined with careful management of your log file names, should prevent duplication of log events in your database.

Adding other indexes to your database may enhance performance of your most common queries. Consult your database documentation for more information.

Table descriptions

This section maps firewall log messages to tables and columns and points to information you may wish to query for your reports. All messages that are mapped to a particular table are listed in the note at the end of the table. Messages that provide data for particular columns are listed in that column's description. The tables contain messages for the IBM Firewall for AIX, the IBM Firewall for Windows NT, and messages that are common to both firewalls.

In the Data Type column in the following descriptions, 'int' is an alias for integer column type for DB2; 'long int' implies DB2 INTEGER type. A date-time Data Type implies DB2 TIMESTAMP. In the timestamp, the microseconds value will always be "000000".

If a description is marked *required*, a value must be specified to enter the record in the table.

The three columns that serve as the unique index and a column for receiving the log level indicator are omitted from these table descriptions because their definitions are identical and there is usually no reason to query them.

Table 1. ADMIN_ALERT. This table contains messages related to intrusion alerts from the a_alert.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (ICA0001, ICA0002, ICA0003, ICA0004, ICA2001, ICA2002, ICA2003, ICA2026, ICA2043, ICA2068, ICA2167, ICA2168, ICA 2170, ICA2173, ICA3001, ICA3012, ICA3018)
ACTION	char(7)	Connect (ICA3012) or bind (ICA3018)
NUM_COUNT	smallint	Number of authentication failures (ICA0001, ICA0002, ICA0003); number of log entries for TAG_MSG_NUM (ICA0004); number of days (ICA9000)
TAG_MSG_NUM	char (8)	Tag message number (ICA0004)
SRC_IP	char(15)	Source IP address (ICA2001, ICA2028, ICA2079, ICA2167, ICA3012, ICA3018)
DST_IP	char(15)	Destination IP address (ICA2028, ICA2079, ICA3012, ICA3018)
AUTH_METHOD	char(20)	Authentication Method (ICA2002, ICA2167, ICA2170)
NETWORK	char(25)	Network name (ICA2001, ICA2002, ICA2167)
HOST_NAME	varchar(100)	Host name (ICA0003, ICA2002)
TIMEOUT_SEC	smallint	Time-out seconds (ICA2026)
CONN_USERID	char(16)	Socks connect user name (ICA3001)
APPLICATION	varchar(30)	Application name such as telnet, ftp, ... (ICA2167, ICA2168, ICA2170, ICA3012)
ERROR_NUM	smallint	System Error number -- AIX errno or Windows NT Last Error (ICA0006, ICA0007, ICA0008, ICA0009, ICA0010, ICA0011, ICA0015)
FILE_NAME	varchar(100)	0016, 0017
Note: Related Messages: ICA0001 ICA0002 ICA0003 ICA0004 ICA0005 ICA0006 ICA0007 ICA0008 ICA0009 ICA0010 ICA0011 ICA0012 ICA0013 ICA0014 ICA0015 ICA0016 ICA0017 ICA0018 ICA0019 ICA0020 ICA0021 ICA0022 ICA1010 ICA2001 ICA2002 ICA2003 ICA2020 ICA2026 ICA2028 ICA2037 ICA2040 ICA2042 ICA2043 ICA2079 ICA2167 ICA2168 ICA2170 ICA2173 ICA3001 ICA3012 ICA3018 ICA9000 ICA9001		

Table 2. FILTER_ACTIVE_RULE. This table contains active FILTER rules from the f_rule.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
RULE_NUM	smallint	Rule number (required)
RULE	varchar(150)	Rule (required)
FILTER_TYPE	smallint	Type of filter being used

Table 2. FILTER_ACTIVE_RULE (continued). This table contains active FILTER rules from the f_rule.tbl file.

Column	Data Type	Short Description
TYPE_ID	smallint	
SERV_ID	smallint	
Note: Related Message: ICA1037		

Table 3. FILTER_INFO. This table contains error or general information messages related to FILTERS from the f_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
RULE_NUM	smallint	Filter rule number (ICA1005)
ERROR_NUM	smallint	System Error number -- AIX errno or Windows NT Last Error (ICA1007, ICA1008, ICA1009, ICA1011 ICA1013, ICA1015, ICA1021, ICA1023, ICA1024) Text corresponding to this error number is obtainable through the _strerror function. Text for Windows NT Last Error is available through the Format Message function or in Appendix A of the Win32 Programmer's Reference Volume 2.
LOAD_PATH	varchar(100)	Kernel extension load path (ICA1011, ICA1012)
DVC_DRV	char(25)	Device driver (ICA1021)
TERM_SIG	char(25)	Termination signal (ICA1260)
FILE_NAME	varchar(100)	File name (ICA1024)
RC	smallint	Internal firewall return code (ICA1019)
Note: Related Messages: ICA1001 ICA1002 ICA1003 ICA1005 ICA1007 ICA1008 ICA1009 ICA1011 ICA1012 ICA1013 ICA1014 ICA1015 ICA1016 ICA1017 ICA1019 ICA1021 ICA1022 ICA1023 ICA1024 ICA1200 ICA1260		

Table 4. FILTER_MATCH. This table contains the filter rules matched from the f_match.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
RULE_NUM	smallint	Rule number (required)
ACTION	char(6)	Rule type: permit, deny, etc.
DIRECTION	char(8)	Direction the packet was traveling inbound or outbound (required)
SRC_IP	char(15)	IP address of the sender (required)
DST_IP	char(15)	IP address of the recipient(required)
PROTOCOL	char(7)	High-level protocol such as UDP, IPIP, TCP or TCP/ACK (required)
SRC_PORT	int	• IP Packet type for ICMP • Resource protocol port number for others (required)

Table 4. FILTER_MATCH (continued). This table contains the filter rules matched from the f_match.tbl file.

Column	Data Type	Short Description
DST_PORT	int	• IP Packet code for ICMP • Destination protocol port number for others (required)
ROUTING	char(5)	Routing affiliation of the packets: route or local (required)
INTERFACE	char(10)	Interface type: secure or nonsecure (required)
FRAGMENT	char(8)	Identifies if the packet is fragment or non-fragment (required)
TUNNEL_ID	int	Tunnel ID (required)
ENCRYPTION	char(10)	Encryption algorithm: 3DES_CBC, DES_CBC, CDMF, or none
BYTES	int	Length of the specific packet (required)
FILTER_TYPE	smallint	Type of filter connection (lower, upper layer, RealAudio or IPSec)
TYPE_ID	smallint	Connection or tunnel identifier
SERV_ID	smallint	Service identifier
ADAPTER	varchar (254)	Adapter name, if specific adapter specified in the filter rule
Note: Related Message: ICA1036		

Table 5. FILTER_STATUS. This table contains information on status changes of filters from the f_stat.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
DAEMON	char(25)	AIX filter logging daemon (ICA1004), or Windows NT filter logging service.
VERSION	smallint	Version number (ICA1004, ICA1033)
RELEASE	smallint	Release number (ICA1004, ICA1033)
PACKET_LOGGING	char(8)	Status of packet logging enabled or disabled (ICA1035)
Note: Related Messages: ICA1004 ICA1032 ICA1033 ICA1034 ICA1035. The details of the filter rule updates (ICA1032) can be obtained from FILTER_ACTIVE_RULEtable.		

Table 6. MAIL_TRACK. This table contains mail tracking message information from the mail_trk.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	Process ID (required)
MSG_NUM	smallint	Message number (required)
HOST	varchar(254)	Host name (ICA2251)
TRACK_ID	varchar(254)	Mail tracking identifier (ICA2251)
SUBJECT	varchar(254)	Mail subject (ICA2251)
MAIL_FROM	varchar(254)	Mail source (ICA2251)
MAIL_TO	varchar(254)	Mail destination (ICA2251)

Table 6. MAIL_TRACK (continued). This table contains mail tracking message information from the mail_trk.tbl file.

Column	Data Type	Short Description
MAIL_SIZE	int	Mail size (ICA2251)
ORIGIN_FROM	varchar(254)	Originator as received (ICA2251)
ORIGIN_TO	varchar(254)	Originator as transmitted (ICA2251)
DEST_FROM	varchar(254)	Destination as received (ICA2251)
DEST_TO	varchar(254)	Destination as transmitted (ICA2251)
STATUS	int	Status (ICA2251)
Note: Related Message: ICA2251		

Table 7. NAT_INFO. This table contains Network Address Translation message information from the nat_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
VERSION	smallint	NAT Version number (ICA9033)
RELEASE	smallint	NAT Release number (ICA9033)
IP	char(15)	IP address (ICA9035, ICA9036)
Note: Related Messages: ICA9032, ICA9033, ICA9034, ICA9035, ICA9036		

Table 8. NAT_MAP. This table contains Network Address Translation message information from nat_map.tbl file.

Column	Data Type	Short Description	Message Number
DATE_TIME	date_time	Date and time for the action (required)	ICA9045, ICA9047, ICA9050, ICA9057, ICA9058, ICA9059
FIREWALL	varchar(100)	NOT NULL, \	ICA9045, ICA9047, ICA9050, ICA9057, ICA9058, ICA9059
PID	int	NOT NULL, \	ICA9045, ICA9047, ICA9050, ICA9057, ICA9058, ICA9059
MSG_NUM	smallint	NOT NULL, \	ICA9045, ICA9047, ICA9050, ICA9057, ICA9058, ICA9059
SECURE_IP	char(15)	Secure IP Addr	ICA9045, ICA9047, ICA9058, ICA9059
SOURCE_IP	char(15)	Source IP Addr	ICA9050, ICA9057
DEST_IP	char(15)	Destination IP Addr	ICA9050, ICA9057
MAP_IP	char(15)	Not Allocated Addr	ICA9045, ICA9047, ICA9058
SECURE_PORT	int	Secure Port Number	ICA9045, ICA9047
SOURCE_PORT	int	Source Port Number	ICA9045, ICA9047
DEST_PORT	int	Destination Port Number	ICA9050
MAP_PORT	int	NAT Allocated Port	ICA9045 ICA9047
SECURE_ICMP	int	Secure ICMP ID	ICA9058 ICA9059
MAP_ICMP	int	NAT Allocated ICMP ID	ICA9058 ICA9059
PROTOCOL	char(10)	High-level protocol such as UDP, IPIP, ICMP, TCP, or TCP/ACK (required)	ICA9050
ICMP_TYPE	int	ICMP type	ICA9057

Table 8. NAT_MAP (continued). This table contains Network Address Translation message information from nat_map.tbl file.

Column	Data Type	Short Description	Message Number
ICMP_CODE	int	ICMP code	ICA9057
RETURN_CODE	int	Return Code	ICA9050 ICA9057

Table 9. PAGER_INFO. This table contains information related to the paging feature of the Firewall, from the pgr_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (ICA4036, ICA4174, ICA4175)
ERROR_NUM	smallint	System Error number - AIX errno or Windows NT Last Error (ICA4371)
PROGRAM	char(25)	Program name (ICA4000)
SIGNAL	int	Termination signal (ICA4000)
ID	int	Identifier (ICA4036)
PRIORITY	smallint	Priority (ICA4036)
PERIOD	smallint	Period (ICA4036)
RETRY_COUNT	smallint	Number of retries (ICA4036, ICA4313, ICA4314, ICA4364, ICA4365)
FROM_ENTRY	char(50)	Function name (ICA4036)
HOST_NAME	varchar(100)	Host name (ICA4174, ICA4175)
MESSAGE_TEXT	varchar(250)	Text of the page (ICA4036, ICA4353 - 4360, ICA4368, ICA4372)
SERVICE	char(25)	Service name (ICA4017)
SOCKET	int	Socket number (ICA4017)
FILENAME	varchar(100)	Filename (ICA4154, ICA4351, ICA4352)
Note: Related Messages: ICA4000 ICA4001 ICA4007 ICA4017 ICA4036 ICA4154 ICA4168 ICA4174 ICA4175, ICA4300 - 4303, ICA4305 - 4315, ICA4351 - 4360, ICA4362 - 4372)		

Table 10. PROXY_FTP. This table contains FTP action information from FTP sessions from the p_ftp.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (required)
SRC_IP	char(15)	IP address of the user (required)
DST_IP	char(15)	IP address of the remote machine (required)
ACTION	char(5)	File transfer action: put or get (required)
FILE_NAME	varchar(100)	File name
BYTES	long int	Amount of data transfered

Table 10. PROXY_FTP (continued). This table contains FTP action information from FTP sessions from the p_ftp.tbl file.

Column	Data Type	Short Description
SID	long int	Unique session ID (required)
Note: Related Message: ICA2075		

Table 11. PROXY_HTTP. This table contains HTTP action information from Proxy sessions from the p_http.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
STATUS	smallint	Status (required)
SRC_IP	char(15)	IP address of the user (required)
REQUEST	varchar(250)	Content of the HTTP request (required)
BYTES	longint	Amount of data transfered.
Note: Related Message: ICA2099		

Table 12. PROXY_INFO. This table contains error or general information messages related to PROXY from the p_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (ICA2018, ICA2019, ICA2057, ICA2058, ICA2166, ICA2177, ICA2172)
ERROR_NUM	smallint	System Error number - AIX errno or Windows NT Last Error (ICA2005, ICA2006, ICA2009, ICA2029, ICA2035, ICA2038, ICA2039, ICA2052, ICA2054, ICA2055, ICA2056, ICA2057, ICA2058, ICA2059, ICA2063, ICA2064, ICA2065, ICA2066, ICA2067, ICA2068, ICA2069, ICA2069, ICA2070, ICA2071, ICA2074, ICA2110, ICA2111, ICA2113, ICA2114, ICA2115, ICA2118, ICA2119, ICA2121, ICA2122, ICA2123, ICA2124, ICA2200, ICA2201, ICA2202, ICA2203) Text for errno (AIX System Errors) is obtainable via the _strerror function. Text for Windows NT Last Error is available through the Format Message function or in Appendix A of the Win32 Programmer's Reference Volume 2.
OPTION_VAL	char(20)	Option flag or parameter value (ICA2014, ICA2015, ICA2049, ICA2050)
TIME	char(15)	Invalid time interval (ICA2044, ICA2202)
RC	smallint	Internal Firewall return code (ICA2007, ICA2030, ICA2031, ICA2033, ICA2034, ICA2054, ICA2057, ICA2058, ICA2065, ICA2120 ICA2166, ICA2203)
INVOC_NAME	char(20)	Invocation name for socket or port at time system error occurred (ICA2055, ICA2056)

Table 12. PROXY_INFO (continued). This table contains error or general information messages related to PROXY from the p_info.tbl file.

Column	Data Type	Short Description
AUDIT_TYPE	char(7)	Unknown audit-type (7 hex digits) (ICA2004)
HOST_NAME	varchar(100)	Host name (ICA2106, ICA2107, ICA2126)
FILE_NAME	varchar(100)	File name (ICA2029, ICA2030, ICA2072, ICA2183, ICA2204, ICA2205, ICA2206, ICA2207)
LINE_NUM	int	Line number (ICA2029, ICA2030)
PROTOCOL	char(25)	Invalid protocol name (ICA2112, ICA2116)
CUSTOMIZED_ATTR	char(25)	Line number (ICA2105, ICA2106, ICA2125, ICA2166)
ODM_ERR_NUM	smallint	Error number from Object Data Manager (ICA2102, ICA2103, ICA2104, ICA2105, ICA2107, ICA2108, ICA2109,ICA2125)
APPLICATION (NT only)	varchar(30)	Application name (ICA2200, ICA2201, ICA2202, ICA2203, ICA2204, ICA2205, ICA2206, ICA2207)
CALLER (NT only)	char(25)	Calling function (ICA2200, ICA2201, ICA2202, ICA2203, ICA2204, ICA2205, ICA2206, ICA2207)
FAILED_IN (NT only)	char(25)	Failing function (ICA2201, ICA2203)
SESSION_ID (AIX only)	char(20)	ICA2192
IP_ADDR (AIX only)	char(15)	ICA2192
SEND_SVR (AIX only)	char(100)	ICA2194
RECV_SVR (AIX only)	char(100)	ICA2194
Note: Related Messages: ICA2004 ICA2005 ICA2006 ICA2007 ICA2009 ICA2014 ICA2015 ICA2018 ICA2019 ICA2023 ICA2029 ICA2030 ICA2031 ICA2032 ICA2033 ICA2034 ICA2035 ICA2038 ICA2039 ICA2044 ICA2045 ICA2046 ICA2047 ICA2048 ICA2049 ICA2050 ICA2051 ICA2052 ICA2053 ICA2054 ICA2055 ICA2056 ICA2057 ICA2058 ICA2059 ICA2060 ICA2061 ICA2062 ICA2063 ICA2064 ICA2065 ICA2066 ICA2067 ICA2068 ICA2069 ICA2070 ICA2071 ICA2072 ICA2073 ICA2074 ICA2100 ICA2102 ICA2103 ICA2104 ICA2105 ICA2109 ICA2110 ICA2111 ICA2112 ICA2113 ICA2114 ICA2115 ICA2116 ICA2117 ICA2118 ICA2119 ICA2120 ICA2121 ICA2122 ICA2123 ICA2124 ICA2125 ICA2126 ICA2127 ICA2166 ICA2171 ICA2172 ICA2183 ICA2200 ICA2201 ICA2202 ICA2203 ICA2204 ICA2205 ICA2206 ICA2207 ICA2192 ICA2194		

Table 13. PROXY_LOGIN. This table contains information (primarily regarding authentication) about successful PROXY logins from the p_login.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (required)
APPLICATION	varchar(30)	Application name - telnet, ftp, ... (required)
AUTH_METHOD	char(15)	Authentication method (required)
NETWORK	char(25)	Network (secure/nonsecure - may have additional information also) (required)
HOST_NAME	varchar(100)	Host name
Note: Related Messages: ICA2024 ICA2025 ICA2169		

Table 14. PROXY_STATUS. If you have an existing Report Utilities database, the PROXY_STATUS table configuration must be altered. Issue the SQL command \″ALTER TABLE PROXY_STATUS ADD SID INTEGER ADD SOCKET CHAR(25) ADD RC SMALLINT ADD CMD CHAR(25) ;\″. If you do not have an existing database, the change will be taken care of automatically when you create the database.)

Column	Data Type	Short Description
DATE_TIME	timestamp	REQ
FIREWALL	varchar(100)	REQ
PID	int	REQ
MSG_NUM	smallint	REQ
USERID	char(16)	2008, 2016, 2021
SRC_IP	char(15)	2000, 2008, 2010, 2011, 2012, 2013, 2141, 2180
DST_IP	char(15)	2000, 2010, 2011, 2012, 2013, 2141
REMOTE_HOST	varchar(100)	2021, 2022, 2027
VERSION	char(10)	2097
SID	int	2177, 2180, 2181, 2182
SOCKET	char(25)	2177
RC	smallint	2181, 2182
CMD	char(36)	2182
Note: Related Messages: ICA1038, ICA1039, ICA1041, ICA1042, ICA1053, ICA1054, ICA1055, ICA1057, ICA1058, ICA1059,ICA1060 • The details of the policy defined (ICA1039) can be obtained from TUNNEL_POLICY table. • The details of the tunnel context defined (ICA1042) can be obtained from TUNNEL_CONTEXT table.		

Table 15. SERVER_INFO. This table contains information about Configuration Server status and activities from the srv_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (ICA9003, ICA9004)
ERROR_NUM	smallint	System Error number – AIX errno or Windows NT Last Error (ICA9008, ICA9009) Text for errno (AIX System Errors) is obtainable with the strerror function. Text for Windows NT Last Error is available through the Format Message function or in Appendix A of the Win32 Programmer's Reference Volume 2.
Note: Related Messages: ICA9003 ICA9004 ICA9005 ICA9006 ICA9007 ICA9008 ICA9009 ICA9010 ICA9011 ICA9012 ICA9013 ICA9014 ICA9015		

Table 16. SESSION. This table contains SOCKS and PROXY session start/stop information from the session.tbl file.

Column	Data Type (length)	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)

Table 16. SESSION (continued). This table contains SOCKS and PROXY session start/stop information from the session.tbl file.

Column	Data Type (length)	Short Description
USERID	char(16)	User ID (required)
SERVICE_TYPE	char(10)	Service type: socks or proxy (required)
APPLICATION	varchar(30)	Application name - telnet, ftp, ... (required)
SRC_IP	char(15)	IP address of the user (required)
DST_IP	char(15)	IP address of the remote machine (required)
SESSION_EVENT	char(5)	• begin when a session is established. • end when a session is terminated. (required)
BYTES	longint	Amount of data transferred during the session. If the application is telnet, this will be 0.
SID	longint	Unique session identifier, generated by the Firewall, based on clock time.
Note: Related Messages: • Safemail Session Start: ICA2178 • Safemail Session Stop: ICA2179 • Socks Session Start: ICA3011 • Socks Session Stop: ICA3015 • Proxy Telnet Session Start: ICA2036 (AIX Logs) ICA2208, ICA2218 (NT Logs) • Proxy Telnet Session Stop: ICA2077 (AIX Logs) ICA2209, ICA2219 (NT Logs) • Proxy FTP Session Start: ICA2041 (AIX Logs) ICA2208, ICA2218 (NT Logs) • Proxy FTP Session Stop: ICA2076 (AIX and NT Logs) Details of Socks FTP session actions are in SOCKS_FTP table. Details of Proxy FTP session actions are in PROXY_FTP.		

Table 17. SOCKS_FTP. This table contains SOCKS FTP action information from FTP sessions from the s_ftp.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (required)
SRC_IP	char(15)	IP address of the user (required)
DST_IP	char(15)	IP address of the remote machine (required)
DATA_BIND	char(5)	• 'start' when data bind is established.(ICA3010) • 'stop' when data bind is terminated.(ICA3014) (required)
BYTES	longint	Amount of data transfered.
Note: Related Messages: ICA3010 ICA3014		

Table 18. SOCKS_INFO. This table contains error or general information messages related to Socks from the s_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
USERID	char(16)	User ID (ICA3044, ICA3045, ICA3046, ICA3047, ICA3049)
ACTION	char(7)	Connect (ICA3044, ICA3049) or bind (ICA3046, ICA3047)
ERROR_NUM	smallint	System Error number - AIX errno (ICA3013, ICA3019, ICA3031, ICA3032, ICA3040, ICA3044, ICA3101, ICA3102, ICA3103, ICA3104, ICA3106, ICA3107, ICA3108, ICA3122, ICA3124, ICA3125, ICA3126, ICA3128)
SRC_HOST	char(25)	Source host name (ICA3019, ICA3035)
DST_HOST	char(25)	Destination host name (ICA3016, ICA3045)
SRC_IP	char(15)	Source address (ICA3042, ICA3043, ICA3044, ICA3045, ICA3046, ICA3047, ICA3049)
DST_IP	char(15)	Destination address (ICA3044, ICA3045, ICA3046, ICA3047, ICA3049)
LINE_NUM	int	Line number (ICA3022, ICA3023, ICA3024, ICA3025, ICA3026, ICA3109, ICA3110, ICA3111, ICA3112, ICA3115, ICA3116, ICA3117, ICA3118, ICA3119, ICA3120); or Number of lines (ICA3113)
EXEC_STATUS	smallint	Exec status (ICA3027)
CMD	char(36)	Command, such as login (ICA3027, ICA3039, ICA3042, ICA3044, ICA3048) Note: for ICA3042, the command is in hexadecimal format
FILE_NAME	varchar(100)	File name (ICA3030, ICA3032, ICA3105, ICA3109, ICA3110, ICA3111, ICA3112, ICA3113, ICA3114, ICA3115, ICA3116, ICA3117, ICA3118, ICA3119, ICA3120)
APPLICATION	varchar(30)	Application name - telnet, ftp... . (ICA3044, ICA3045, ICA3049)
VERSION	char(10)	Socks version number in hex (ICA3043)
Note: Related Messages: ICA3013 ICA3016 ICA3017 ICA3019 ICA3022 ICA3023 ICA3024 ICA3025 ICA3026 ICA3027 ICA3030 ICA3031 ICA3032 ICA3033 ICA3035 ICA3039 ICA3040 ICA3041 ICA3042 ICA3043 ICA3044 ICA3045 ICA3046 ICA3047 ICA3048 ICA3049 ICA3052 ICA3101 ICA3102 ICA3103 ICA3104 ICA3105 ICA3106 ICA3107 ICA3108 ICA3109 ICA3110 ICA3111 ICA3112 ICA3113 ICA3114 ICA3115 ICA3116 ICA3117 ICA3118 ICA3119 ICA3120 ICA3121 ICA3122 ICA3123 ICA3124 ICA3125 ICA3126 ICA3127 ICA3128		

Table 19. SSL_INFO. This table contains information about SSL status and activities from the ssl_info.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)

Table 19. SSL_INFO (continued). This table contains information about SSL status and activities from the ssl_info.tbl file.

Column	Data Type	Short Description
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
CLIENT_IP	char(15)	IP address of the client
Note: Related Messages: ICA5015 ICA5022 ICA5023 ICA5028 ICA5029 ICA5036 ICA5039 ICA5060 ICA5063 ICA5082 ICA5120		

Table 20. SU. This table contains details about SU activities from the su.tbl file if you are loading an AIX su log.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required) Because AIX does not record the year in the su log file, the year portion of the DATE_TIME column is set to either the current year or the previous year, based on the month/day settings (if month/day is later than current month/day, assume it is last year.)
FROM_USERID	char(16)	User ID (required)
TO_USERID	char(16)	User ID (required)
LOGIN_STATUS	char(7)	Status of login attempt: success or failure (required)

Table 21. TUNNEL_CONTEXT. This table contains active TUNNEL context specifications from the t_cntxt.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
TUNNEL_ID	longint	Tunnel ID (required)
SRC_IP	char(15)	Source IP address (required)
DST_IP	char(15)	Destination IP address (required)
ENCRYPTION	char(10)	Encryption algorithm: 3DES_CBC, DES_CBC, or CDMF
Note: Related Message: ICA1043		

Table 22. TUNNEL_POLICY. This table contains TUNNEL policy statememts from the t_policy.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	int	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
POLICY	char(60)	Policy statement read from fwpolicy file (required)
Note: Related Message: ICA1040		

Table 23. TUNNEL_STATUS. This table contains information on status changes of TUNNELS from the t_stat.tbl file.

Column	Data Type	Short Description
DATE_TIME	date_time	Date and time for the action (required)
FIREWALL	varchar(100)	Fully qualified name of the firewall machine (required)
PID	longint	AIX Process ID, Windows NT thread ID (required)
MSG_NUM	smallint	Message number (required)
SESSION_SCKT	longint	Session socket port (for ICA1038)
MASTER_SCKT	longint	Master socket port (for ICA1038)
TUNNEL_ID	longint	Tunnel ID deleted (for ICA1041, ICA1057, ICA1058, ICA1059, ICA1060)
Note: Related Messages: ICA1038 ICA1039 ICA1041 ICA1042, ICA1053, ICA1054, ICA1055, ICA1057, ICA1058, ICA1059, ICA1060 • The details of the policy defined(ICA1039) can be obtained from TUNNEL_POLICY table. • The details of the tunnel context defined(ICA1042) can be obtained from TUNNEL_CONTEXT table.		

Table 24. EFM_INFO. This table contains information on status changes of Enterprise File Manager from the efm_info.tbl

DATE_TIME	timestamp	REQ
FIREWALL	varchar (100)	REQ
PID	int	REQ
MSG_NUM	smallint	REQ
USERID	char (8)	9022, 9024, 9026, 9030
LOGON_MODE	char (10)	9021, 9022
RC	smallint	9025, 9029, 9031
FUNCTION	char (25)	9031
HOST_NAME	var(100)	9024, 8026, 9030

Chapter 3. Providing Your Own Authentication Methods

This chapter gives you information on providing your own authentication methods.

There are two methods for user-supplied authentication:

1. Using executables fwuserpt and fwuserau, which authenticates a user based on a response to a single prompt.
2. Using the functions fwprompt, fw_tn_authenticate, and fw_ftp_authenticate, which authenticates a user based on responses to one or more prompts. This method is known as user-supplied iteration because the prompting is an iterative process.

You can use either method but not both. If fwuserpt and fwuserau are present in `/usr/bin`, then method 1 is used.

User-Supplied Authentication

To use user-supplied authentication as an authentication method, the firewall administrator must provide two executables: **fwuserpt** and **fwuserau**. The fwuserpt code provides the text that will prompt the user for an authentication token. The fwuserau code authenticates the user based on the response to the prompt.

If you choose the user-supplied authentication method for a firewall proxy user, the IBM Firewall takes these actions when that user logs on :

- Prompts the user for a user name.
- Invokes **fwuserpt** passing the user name as the input parameter.
- **fwuserpt** executes a `printf` statement to display a prompt to the user.
- Receives the printf string and displays it on the user console.
- Reads the user response, which may be multiple tokens on a single line.
- Invokes **fwuserau** passing the User Name and all the tokens read from the user terminal.
- Accepts or rejects the user based on the return code from **fwuserau**.

FWUSERPT and FWUSERAU Specifications

The executables, **fwuserpt** and **fwuserau** reside in `/usr/bin`. These subroutines are supported when compiled in an AIX machine compatible with the version of the firewall the subroutines are intended to run on. Once executed, the ownership is transferred to root.

fwuserpt takes user name as the input. It performs a database lookup or calculation and outputs a string using a printf statement. For example, if John is the user, **fwuserpt** can create one of the following as output:

- Please enter your secret code for authentication
- Secret code is required for John
- Secret code corresponding to 1345 is required for John. (1345 is a string associated with John.)

The return codes for **fwuserpt** and **fwuserau** are zero if successful and non-zero if unsuccessful.

The input to **fwuserau** are the user name and the strings of 'password' supplied by the user. If the password consists of a sequence of strings as in the case of Secure Key, they are in argv[2], argv[3], argv[4], argv[5] and so on.

The string **fwuserpt** issues with printf must not contain any special character like '\n' or '\r', otherwise, the result is unpredictable. It must contain a fflush statement after printf. The **fwuserau** must not contain any print statements, otherwise, the result is unpredictable.

Example of fwuserpt and fwuserau

The following is an example of **fwuserpt** and **fwuserau** with authentication performed.

Compile the following and name the output file **fwuserpt**.

```
int main (int argc, char **argv)
   {char *user = NULL;  /* name of user to be authenticated */
   user = argv [1];
   if (user == NULL)
   {return 1;}
   /* Note, if you cannot validate the userid, return
   1 and fwuserau will not be called */
   printf ("User Supplied auth invoked. Please supply your password.");
   (void) fflush(stdout);
   return 0;}
```

Compile the following and name the output file **fwuserau**.

```
int main(int argc, char **argv)
   {char *user = NULL;  /* name of user to be authenticated*/
   user = argv[1];
   if (user == NULL)
   {return 1;}
   /* retrieve the authentication token from
   argv[2], argv[3], etc depending on the
   interface, ie, the number of tokens the user is expected to
   input at the prompt and validate the user.
   return 0 if successful.
   return 1 if unsuccessful*/}
```

Secure Key as an Example of User-Supplied Authentication

Sample code using Secure Key as an example of user- supplied authentication is provided in the `/usr/lpp/FW/sample` directory. These files are:

- makefile.ex
- fwuserpt.c
- fwuserau.c.

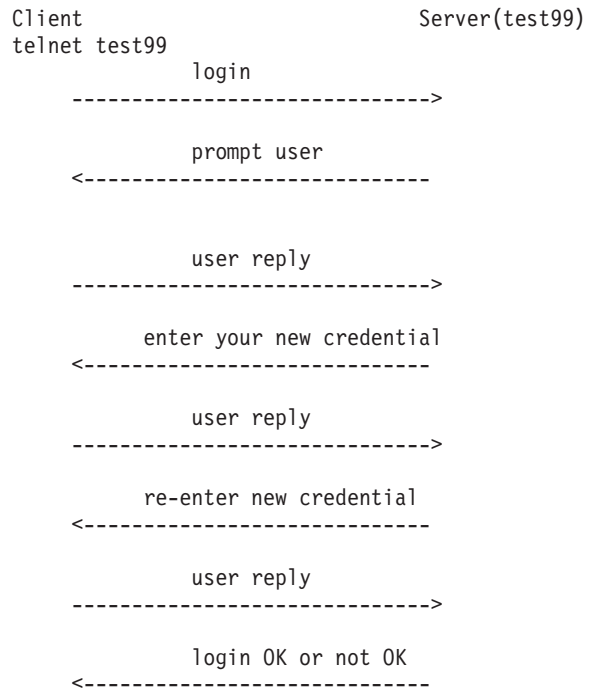
These files have been used to test our user-supplied authentication API code and are provided as is.

User-Supplied Iteration Support

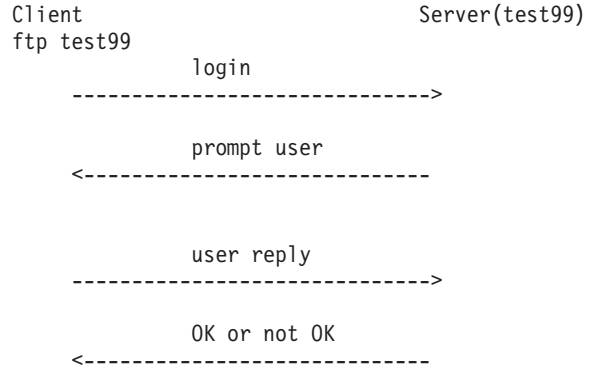
User-supplied iteration enables you to require multiple responses from a user attempting to logon, instead of just one prompt and one reply.

This user-supplied authentication method provides support for iterating through a loop during authentication for telneting. So, for example you can have telnet do a looping instead of doing just one prompt and one reply from users.

The following diagram depicts the user-supplied support for telnet :



The following diagram depicts the user-supplied support for ftp :



The following sections explain how to accomplish iterative prompting.

Library Requirements

You must supply the library functions that the firewall invokes. The name of the shared library file is **fwuser.o**. This file must reside in /usr/lib. In addition, **fwuser.exp** must be present in /usr/lib. This library must contain the following functions:

- fw_prompt
- fw_tn_authenticate

- fw_ftp_authenticate

Note: Iteration does not apply to FTP; however, FTP authentication is supported.

During installation of the IBM Firewall, copies of **fwuser.o** and **fwuser.exp** are installed in /usr/lib. If a copy of **fwuser.o** already exists in /usr/lib, it will not be replaced during installation.

When you invoke the IBM-supplied **fwuser.o**, a message reminding you to supply your own version of user-written authentication is put into the local4 log.

The IBM- supplied **fwuser.o** denies authentication for FTP and telnet.

Details of fw_prompt

fw_prompt authenticates the user using FTP.

fw_prompt prompts the user for the returned string, ***password***, for example.

fw_prompt verifies that a name is authorized in the database and displays messages to the user.

fw_prompt takes two arguments, a pointer to username (characters) and ret_code. ret_code is a pointer to a data structure called **fw_ret_struct** which is defined in **fwuser.h**. **fwuser.h** can be found in the /usr/lpp/FW/sample subdirectory.

In the argument ret_code, the req_rsp_code is set to FW_AUTH_REQ (request for prompt for username).

- **fw_prompt** uses the username to compute a prompt in the form of a string and puts it in ret_code->return_str to be displayed to the user.
- ret_code->return_str must not contain any special character like '\n'.
- If verification of username is successful, **fw_prompt** puts a string in ret_code->return_str to be displayed to user and sets the req_rsp_code to be FW_AUTH_OK. Setting req_rsp_code to anything else means the authentication failed.

Following is an example of the function for fw_prompt. This can be found in /usr/lpp/FW/sample/fwprompt.c.

```
#include <stdio.h>
#include <stdlib.h>
#include "fwuser.h"


int fw_prompt (char *username, struct fw_ret_struct *ret_code)
{
  strcpy(ret_code->return_str, "Please enter password");
  ret_code->req_rsp_code = FW_AUTH_OK;
  return FW_AUTH_OK;
}
```

Details of fw_tn_authenticate

fw_tn_authenticate authenticates the user using telnet.

fw_ftp_authenticate is the function that authenticates a user using FTP.

fw_tn_authenticate takes three arguments:

- a pointer to username
- a pointer to response
- a pointer to a data structure called ret_code.

ret_code, also called **fw_ret_struct**, is defined in **fwuser.h**. The description of the various arguments are:

- **username** always points to a NULL terminated string or user ID of the user.
- **response** points to a NULL terminated string or NULL.

If **response** points to NULL and the req_rsp_code is set to FW_AUTH_REQ, this is the first time **fw_tn_authenticate** is called for the user specified by the username. For example, when a telnet session is initiated, before any prompt is displayed, **fw_tn_authenticate** is called with response set to NULL and req_rsp_code set to FW_AUTH_REQ,

The ret_code is used to pass information back and forth betweeen the firewall and fw_tn_authenticate.

Ret_code can have these values:

FW_AUTH_REQ
: The initial setting; indicates the first call to fw_tn_authenticate

FW_AUTH_OK
: The user has been verified; authentication is successful. fw_tn_authenticate is not called again.

FW_AUTH_FAILED
: The user has not been verified. fw_tn_authenticate is not called again for that user. The user is rejected.

FW_AUTH_MISSING
: fwuser is missing and authentication will fail.

If ret_code is set to anything other than these values, fw_tn_authenticate is called again. You should define a code, such as FW_AUTH_INIT, to indicate authentication is continuing and fw_tn_authenticate should be called again.

The **return_str** is the string firewall will display to the user for response. This **return_str** must NOT contain any special characters like '\n'.

For example, if an authentication uses a sequence of passwords defined by the user, the user can define FW_AUTH_CONT_REQ as 3 and FW_AUTH_INIT_REQ as 2 and put these in **fwuser.h**. When **fw_tn_authenticate** is first called, the second parameter is set to NULL and req_rsp_code is set to FW_AUTH_REQ. Then **fw_tn_authenticate** can put a string like "Enter the initial code" in the return_str and set req_rsp_code to be FW_AUTH_INIT_REQ.

When **fw_tn_authenticate** is called again, the second parameter will point to a string of response and the req_rsp_code will be FW_AUTH_INIT_REQ. If further input from the user is needed, **fw_tn_authenticate** can put "enter your second response" and set the req_rsp_code to FW_AUTH_CONT_REQ. When **fw_tn_authenticate** is called again, the second parameter will point to the second reponse given by the user and the req_rsp_code will be FW_AUTH_CONT_REQ.

If **fw_tn_authenticate** is satisfied with the response, **fw_tn_authenticate** will set req_rsp_code to FW_AUTH_OK and return FW_AUTH_OK.

If **fw_tn_authenticate** is not satisfied with the user response, it will set req_rsp_code to be FW_AUTH_FAILED and return.

Here is an example of **fw_tn_authenticate** that implements the above scenario. In this example, the user is first asked to enter ″password″ and the second authentication asks the user to enter the changed ″password″.

```
/* This is an example of two iteration authentications. It first asks user to input
a response and based on the response, asks the user for a second response
for authentication */
#include <stdio.h>
#include <stdlib.h>
#include "fwuser.h"
int fw_tn_authenticate (char *username, char *response, struct fw_ret_struct *ret_code)
{
  if (username == NULL) {
    return FW_AUTH_FAILED;
  }
  if (ret_code == NULL)  {
    return FW_AUTH_FAILED;
  }
  memset(ret_code->return_str, 0x00, sizeof(ret_code->return_str));
  if ((response == NULL) &&;amp; (ret_code->req_rsp_code == FW_AUTH_REQ)) {
    ret_code->req_rsp_code = FW_AUTH_INIT_REQ;
    strcpy(ret_code->return_str, "Please enter password");
    return FW_AUTH_OK;
  }
  else {
    switch (ret_code->req_rsp_code) {
      case FW_AUTH_INIT_REQ:
        if (strcmp(response, "password") == 0) {
          ret_code->req_rsp_code = FW_AUTH_CONT_REQ;
          strcpy(ret_code->return_str, "Please enter password");
          return FW_AUTH_OK;
        } else {
          ret_code->req_rsp_code = FW_AUTH_FAILED;
          return FW_AUTH_FAILED;
        } /* endif */
        break;
      /* put other case statement defined in fwuser.h */
      case FW_AUTH_CONT_REQ:
        if (strcmp(response, "password") == 0) {
          ret_code->req_rsp_code = FW_AUTH_OK;
        }
        else {
          ret_code->req_rsp_code = FW_AUTH_FAILED;
        }
        return FW_AUTH_OK;
      /* put other case statement defined in fwuser.h */
      default:
        ret_code->req_rsp_code = FW_AUTH_FAILED;
        return FW_AUTH_FAILED;
        break;
    }   /* switch */
  }
  return FW_AUTH_FAILED;
}
```

Details of fw_ftp_authenticate

fw_ftp_authenticate authenticates the user using FTP.

The argument taken by **fw_ftp_authenticate** is identical to that of **fw_tn_authenticate**. It can only return FW_AUTH_FAILED or FW_AUTH_OK. Any value other than FW_AUTH_OK in req_rsp_code will fail.

If the authentication is successful, the value in req_rsp_code must be set to FW_AUTH_OK and the returned value of the function is FW_AUTH_OK. Returning non-zero by the function or setting req_rsp_code to be anything other than FW_AUTH_OK means authentication failed. This file can be found in /usr/lpp/FW/sample/fwauthen.c.

Following is an example of **fw_ftp_authenticate**.

```
/*
 * The following is an example of user authentication. It uses a
 * two stage authentication method. This procedure is provided as
 * is. The first time this procedure is invoked, it asks the user to respond with "password".
 * If the user responds properly, it asks the user
 * to respond with "changed password". If the user responds properly, then
 * the user is authenticated. Otherwise, the authentication fails.
 * FW_AUTH_INIT_REQ and FW_AUTH_CONT_REQ are user defined constants that
 * are defined in fwuser.h. The IBM Firewall does not use
 * these two constants. The constants are defined in fwuser.h.
 * The IBM Firewall uses (and user must not redefine) FW_AUTH_FAILED, FW_AUTH_OK and FW_AUTH_REQ.
 * The fwuser.o that is being installed was not compiled using this program.
 */

#include <stdio.h>
#include <stdlib.h>
#include "fwuser.h"


int fw_tn_authenticate (char *username, char *response, struct fw_ret_struct *ret_code)
{

  if (username == NULL) {
    return FW_AUTH_FAILED;
  }
  if (ret_code == NULL)  {
    return FW_AUTH_FAILED;
  }

  memset(ret_code->return_str, 0x00, sizeof(ret_code->return_str));
  if ((response == NULL) &&;amp; (ret_code->req_rsp_code == FW_AUTH_REQ)) {
    ret_code->req_rsp_code = FW_AUTH_INIT_REQ;
    /*
      In here, the program makes a computation or database lookup
      for username. It then comes up with a prompt for the user to
      enter the response. In this example, the user is asked to
      enter 'password' as a string. It can be changed to
      'please enter your password' or 'please enter your code'
      or any appropriate message to prompt the user for response.
    */
       strcpy(ret_code->return_str, "Please enter password");
       return FW_AUTH_OK;
       }
       else {
       switch (ret_code->req_rsp_code) {
       case FW_AUTH_INIT_REQ:/*
       The program is checking the response to see if it is valid.*/
       if (strcmp(response, "password") == 0) {
       ret_code->req_rsp_code = FW_AUTH_CONT_REQ;/*
       In this example, the first reponse from the user is valid and the user
       is asked to enter the'changed password'. If the administrator,
       after looking up the user's credential, determines that the
       password has expired, a prompt requesting user change the
       password can be issued.
```

```
    */
         strcpy(ret_code->return_str, "Please enter changed password");
          return FW_AUTH_OK;
        } else {
          ret_code->req_rsp_code = FW_AUTH_FAILED;
          return FW_AUTH_FAILED;
        }
        break;
      /* put other case statement defined in fwuser.h */
      case FW_AUTH_CONT_REQ:
        /*
   Computation is done to check the validity of
   the response.*/
        if (strcmp(response, "changed password") == 0) {
          ret_code->req_rsp_code = FW_AUTH_OK;
          return FW_AUTH_OK;
        }
        else {
          ret_code->req_rsp_code = FW_AUTH_FAILED;
          return FW_AUTH_FAILED;
        }
      /* put other case statement defined in fwuser.h */
      default:
        ret_code->req_rsp_code = FW_AUTH_FAILED;
        return FW_AUTH_FAILED;
        break;
    }   /* switch */
  }
  return FW_AUTH_FAILED;
}


/* The following procedure is called after user responses to fwprompt. */
/* It only check to see if the response is password                    */

int fw_ftp_authenticate (char *username, char *response, struct fw_ret_struct *ret_code)
{

  if (username == NULL)  return FW_AUTH_FAILED;
  if (response == NULL)  return FW_AUTH_FAILED;

  /* checking the validity of the response based on the return */
  if (strcmp(response, "password") == 0) {
    ret_code->req_rsp_code = FW_AUTH_OK;
    return FW_AUTH_OK;
  }
  else {
    ret_code->req_rsp_code = FW_AUTH_FAILED;
    return FW_AUTH_FAILED;
  }
}
```

Sample Makefile for fwuser.o

Following is an example of a makefile for making **fwuser.o**. In this example, fwauthen.c contains **fw_tn_authenticate** and **fw_ftp_authenticate**. **fwprompt.c** contains **fw_prompt**. Call this makefile Makefile.lib. This information can be found in/usr/lpp/FW/sample/Makefile.lib.

```
CDEBUGFLAGS=

LDFLAGS=
CDEBUGFLAGS=

HASSTDLIB=-DHASSTDLIB
```

```
LIB=fwuser.o
LIBOBJS=fwauthen.o fwprompt.o

CFLAGS=$(CDEBUGFLAGS) $(HASSTDLIB)

all:   $(LIB)


$(LIB):  $(LIBOBJS)
        cc $(HASSTDLIB) -o fwuser.o $(LIBOBJS) -bE:fwuser.exp -bM:SRE -e _t

fwauthen.o:     fwauthen.c      fwuser.h
fwprompt.o:     fwprompt.c fwuser.h
```

fwuser.o can be obtained by executing the following command after renaming fwuser.exp.df to fwuser.exp:

- make -f Makefile.lib

The sample files Makefile.lib, fwuser.h, fwauthen.c and fwprompt.c are in /usr/lpp/FW/sample. A copy of fwuser.exp.df is also in /usr/lpp/FW/sample.

```
 ]> --> /* -- BEGIN COPYRIGHT -- *  *  *
IBM Firewall for AIX - Version 3 Release 1.0  *  *
5765-C16
(C) Copyright IBM Corp. 1994, 1997  *
All Rights Reserved  *
Licensed Material - Property of IBM  *  *
US Government Users Restricted Rights -  *
Use, duplication or disclosure restricted by GSA ADP
Schedule Contract  *
with IBM Corp.  *  *
-- END COPYRIGHT -- */


/*  * The following is the header file needed to compile
fwauthen.c and  * fwprompt.c.
This procedure is provided as is.  *
Users must not change the definition of FW_AUTH_FAILED,
FW_AUTH_OK and  *
FW_AUTH_REQ.
However, users can add some other definitions which are  *
relevant to the user's authentication method.
FW_AUTH_INIT_REQ and  *
FW_AUTH_CONT_REQ are added and are referenced by fwauthen.c
in the  *
sample given.
*/#ifndef _H_FWUSER_ #define _H_FWUSER_
   #define FW_AUTH_OK        0
/* Authentication successful,  */
/* put in ret_req_code         */
/* by fw_tn_authenticate.      */
/* Do NOT redefine this value. */
  #define FW_AUTH_REQ       1
/*Requests authentication.     */
/* Do NOT redefine this value. */
  #define FW_AUTH_INIT_REQ  2
/* Used by fw_tn_authenticate. */
/* Can be redefined by user.   */
  #define FW_AUTH_CONT_REQ  3
/* Used by fw_tn_authenticate. */
/* Can be redefined by user.   */
  #define FW_NO_DISP_RSP 0x01
/* If opt for no Response:     */
/* set this in sec_rc          */
```

```
  #define FW_AUTH_MISSING  98
/* Set if fwuser.o was not modified  */
/* for user supplied authentication. */
/* Do NOT redefine this value.       */
  #define FW_AUTH_FAILED   99
/* Authentication failed.            */
/* Do NOT redefine this value.       */
Examples of additional return codes to be defined for use with
fw_tn_authenticate.
  #define FW_AUTH_UPDATE    4
  #define FW_AUTH_CHANGE    5
/* struct fw_ret_struct {   int req_rsp_code;
/* Request / response code */
 int     sec_rc;
/* Reserved for future use           */
 char    return_strÝ254¨;
/* return string to be displayed for */
/* user.                             */ };
 #endif /* _H_FWUSER_ */

               End of file
```

To compile the sample files, rename fwuser.exp.df to fwuser.exp.

Migration

If both of the files /usr/bin/fwuserau and /usr/bin/fwuserpt are present, the functions in /usr/lib/fwuser.o will not be called. If you want to use the functions in fwuser.o, fwuserau or fwuserpt must be removed or renamed.

Chapter 4. Using Network Management with the IBM Firewall

This chapter describes how to use the Simple Network Management Protocol (SNMP) to monitor your IBM Firewall resources.

SNMP is an open application protocol used in a TCP/IP environment for managing network functions. This chapter assumes familiarity with SNMP. The IBM Firewall uses the Management Information Base (MIB) and the SNMP Subagent to monitor the status of servers (INETD, FWPAGERD, FWMAILD, NAMED, PHTTPD, and SOCKD) and critical log records.

Management information is the abstraction of managed resources. These resources are defined as managed objects. The collection of managed objects is called a MIB. The MIB acts as the information store of the definition and specification of SNMP managed objects. The SNMP Subagent is a program or process that handles a specific portion of the MIB. The MIB registers with the SNMP agent so the agent knows where to send requests for the variables requested.

The SNMP agent performs all management operations as inspections or alterations of managed objects. The management operations are **get** or **getnext**. However, the firewall subagent does not support **set**.

The subagent can also emit unsolicited messages through ″traps″.

To set up SNMP traps:

1. Edit the /etc/snmpd.conf file

   There is a line in this file that defines where the traps are sent. It looks like this:

   ```
   trap   public   1.23.456.78   1.2.3   fe

   where

   community name is public
   IP address of the manager to receive the trap is 1.23.456.78
   view=1.2.3
   traps to be blocked
   ```

   The last field (fe) indicates what traps you want to block:

   ```
   fe    block no traps (1111 1110)
   7e    block coldStart trap (0111 1110)
   be    block warmStart trap (1011 1110)
   3e    block coldStart trap and warmStart trap (0011 1110)
   ```

   There are many coldStart traps that are issued when SNMP starts. The mask of 7e may be used to block the coldStart traps.
2. Modify this trap line to point to an SNMP Manager address as follows:

   ```
   trap   public   9.67.128.41  1.2.3  fe
   ```
3. The SNMP manager administrator sets up an SNMPTRAP listener application on the machine at the address specified on the trap statement in the /etc/snmpd.conf file.
4. When any of the six monitored servers changes states from Running to Not Running or vice versa, a trap is sent to the address defined in the trap statement in the /etc/snmpd.conf file on the firewall machine.

Note: Only one trap statement is allowed. If more than one trap statement is added, there is no error message on startup, but only the first trap definition entry specifications are used.

These are servers and codes received when a trap is received on the manager and monitored by the firewall SUBAGENT. (For example, 69 6E 65 74 64 is not running.) The numerical codes are the ASCII representation of the server names.

```
Not Running     6E 6F 74 20 52 75 6E 6E 49 62 67
Running         6E 49 6E 47
Not Running
INETD           69 6E 65 74 64                          /    /
FWPAGERD        66 77 70 61 67 65 72 64                 /    /
FWMAILD         66 77 6D 61 69 6C 64                    /    /
NAMED           6E 61 6D 61 64                          /    /
PHTTPD          70 68 74 74 70 64                       /    /
SOCKD           73 6F 63 66 64                          /    /
```

The subagent monitors the `firewall log` facility for -e, -i, and -w alert messages of emergency warning or information levels, and notifies the SNMP daemon of these alerts. A `firewall log` facility of at least information priority should be created.

SNMP trappable events

```
    ICA0001e  Threshold conditions for authentication failures
              have been satisfied
    ICA0002e  Threshold conditions for detecting a specific
log
              message have been satisfied
    ICA0003e  Threshold conditions for authentication failures
              from any specific host have been satisfied
    ICA0004e  Threshold conditions for detecting a specific
log
              message have been satisfied
    ICA0012e  Daemon is abending or received terminate signal.
              Previous log messages would provide detail.
    ICA1010i  The /usr/sbin/fwlogd daemon must be started
under root authority
    ICA2001e  A user, without an account, attempted to use ftp
              proxy from the network
    ICA2002e  Firewall is unable to authenticate the indicated
              username using the specified authentication
method
    ICA2026i  Connection attempt timed out for specified user.
              Potential network routing problem or remote host
              is not available
    ICA2043i  Authentication type for this user is 'password'
              and no password was found.
    ICA3001e  Real user is ident username,not socks connect
username
    ICA3012w  refused -- Connect from ser(real_user)@src_addr
              to dst_addr (application)
    ICA9000i  Internet Connection IBM Firewall (FW) evaluation
              expires in number of days
```

SystemView Agent and SystemView Mapper are installed before the SNMP subagent can be invoked.

Note: The hostname must be known to itself. The /etc/hosts should have an entry of itself.

An SNMP manager is refreshed when an SNMP manager is added or deleted from the IBM Firewall.

If the filter is active, start an SNMP manager by:

1. Creating an object of the network manager with IP address.
2. Assuming there is an object for this firewall.
3. Creating a service to permit an SNMP query.
4. Creating a connection between the firewall interface and the manager.

The user must define filter rules to enable traps to go through the firewall.

A default.config file is shipped upon new installation. During the installation, no filter is activated. A pre-defined SNMP filter can be selected. If no permit on the filter rules is selected, all SNMP traffic is denied. If traffic does not match a permit rule or a denied rule, the traffic is denied.

Neither the SNMP daemon network agent (snmpd) or the SNMP firewall subagent is started during installation. Later when the subagent is started through the configuration client and the firewall is brought down abruptly, rebooting the firewall starts the subagent automatically using the operational values given in the `/etc/security/fwsubagt.cfg` . If this file is missing, default values are used and `/etc/security/fwsubagt.cfg` is created.

Only the root authority can make changes to the Firewall Manager or starting subagent.

SNMP - Management Information Base (MIB)

See "Appendix C. SNMP Management Information Base (MIB)" on page 141 for more information on the MIB.

Chapter 5. Using the Make Key File Utility (MKKF)

If you have purchased the No Encryption version of the IBM SecureWay Firewall for AIX, this chapter does not apply.

A secure SSL network connection requires that you have:

- Configured your configuration server for SSL
- Created a key for secure communications
- Been designated as a trusted root on your server
- Stashed your key file password

Use MKKF to create the initial server key, key ring file, and certificate request. MKKF is also used to receive the initial certificate into a key ring and stash your key file password.

Creating a key file

You can create a key file for the firewall machine that can be used for both IPSEC and the configuration server.

Since the key file must be owned by the root user name, you should run this utility logged on as root.

Note: Do not give any other user or group ownership of the key file.

1. Go to the /etc/security directory and start the key utility by entering:

   ```
   # mkkf

   MKKF Key Manager
   Copyright IBM Corp. 1996
   All Rights Reserved
   ```

2. Create a new key ring file.

   ```
   Key Ring Menu
   Currently Selected Key Ring: (none)

   N - Create New Key Ring File
   O - Open Key Ring File
   X - Exit

   Enter a command: n
   ```

   Enter 'n' as shown above to create a new key file.

   You will be prompted for a file name to use for the key file. You can use any file name, but it must end in .kyr. By default, the firewall looks for a file named fwkey.kyr.

   Enter a name for the key ring file, or press ENTER to accept the default of **fwkey.kyr**

   MKKF will create a new key file and display the key ring menu. Note that the key file will be listed as the currently selected key ring.

3. Create a new key and certificate request.

```
Key Ring Menu
Currently Selected Key Ring: fwkey.kyr

N - Create New Key Ring File
O - Open Key Ring File
S - Save Key Ring File
A - Save Key Ring as Another File
P - Set Password for Key Ring File
C - Create Stash File for Key Ring File
R - Receive a Certificate into a Key Ring File
W - Work with Keys and Certificates
X - Exit

Enter a command: w
```

Enter 'w', as shown above, to go to the Key menu.

```
Key Menu
Currently Selected Key Ring: fwkey.kyr
Selected Key Entry: (none)

L - List/Select a key to work with
C - Create a New Key and Certificate Request
I - Import a key from an Armored key file
X - Exit this menu

Enter a command: c
```

Enter 'c', as shown above, to create a new key.

Before a key can be stored in a key file, the key file must be password protected. MKKF will prompt you to enter a password to use to protect the key file. The password will not display when you type it. MKKF will also ask if the password should expire. Enter 'n' as shown below:

```
Enter password to use for the key file:
password
Enter the password again for verification: password
Should the password expire?
Enter Y for yes or N for no:
n
Password successfully set.
Press ENTER to continue.
```

MKKF will prompt you for the type of key to create.

```
Choose Certificate Type Menu
S - PEM Certificate Request Format (Private Enhanced
Message)
P - PKCS10 Certificate Request Format
C - Cancel

Enter a command: s
```

Enter 's', as shown above, to create a PEM Certificate Request Format. MKKF will generate an empty certificate:

```
Compose Secure Server Certificate Menu

Current Certificate Information
Key Name: (none)
Key Size: 0
Server Name: (none)
Organization: (none)
Organization Unit: (none)
City/Locality: (none)
```

```
State/Province: (none)
Postal Code: (none)
Country: (none)

M - Modify the Certificate Fields
R - Ready To Create Key and Certificate Request
C - Cancel

Enter a command: m
```

Enter 'm' to modify the empty certificate. You will be prompted to enter information about the new certificate:

- Enter a name to use. This name can be any string and is used only by the MKKF utility:

  ```
  Enter a name to use for the key entry:

  Firewall Key
  ```

- Enter the size of the key. The IBM Firewall ships only the exportable version of MKKF. The maximum key size is 512.

  ```
  1:   508
  2:   512
  Enter the number corresponding to the key size you want:

  2
  ```

- Enter the fully qualified TCP/IP host name for the firewall (for example, jupiter.raleigh.ibm.com):

  ```
  Enter the server's fully qualified TCP/IP domain name or press
  Enter by itself to leave the field blank

  jupiter.raleigh.ibm.com
  ```

- Enter an organization name to associate with the certificate (for example, the company name):

  ```
  Enter Organization Name for the certificate
  or press ENTER by itself to leave the field blank.

  AAA Inc.
  ```

- Enter the organizational unit name (for example, a department name):

  ```
  Enter Organizational Unit Name for the certificate
  or press ENTER by itself to leave the field blank.

  Network Security Products
  ```

- Enter a city where the certificate will be used:

  ```
  Enter Locality/City Name for the certificate
  or press ENTER by itself to leave the field blank.

  RTP
  ```

- Enter a state or province.

Note: Due to the specifications for certificates, this field must be a minimum of three characters, so two-letter state abbreviations are not valid.

```
Enter State/Province Name for the certificate
or press ENTER by itself to leave the field blank.
State/Province must be at least three characters long.

N.C.
```

- Enter a postal code to associate with the certificate. (This is the same thing as a zip code):

```
Enter Postal Code for the certificate
or press ENTER by itself to leave the field blank.

27709
```

- Enter a two-letter country code:

```
Enter Country Code for the certificate
or press ENTER by itself to leave the field blank.
Country code must be exactly two characters long.

US
```

After MKKF has collected all the information from you, the certificate will be displayed:

```
Compose Secure Server Certificate Menu

Current Certificate Information
Key Name: Firewall Key
Key size: 512
Server Name: jupiter.raleigh.ibm.com
Organization: AAA Inc.
Organizational Unit: Network Security Products
City/Locality: RTP
State/Province N.C.
Postal Code: 27709
Country: US

M - Modify the Certificate Fields
R - Ready To Create Key and Certificate Request
C - Cancel

Enter a command: r
```

If there are any mistakes in the certificate information, you can enter 'm' to make corrections. If the information is correct, enter 'r' to create the new key and its associated key file.

MKKF will prompt you for a file to store the certificate. You can use any file name, but a good convention to follow is to use the same base name as the key file and add .cert as the extension:

```
Enter file to store the certificate request in:
fwkey.cert
Creating Private Key...
```

```
Private key was successfully created.
Creating certificate request...
certificate request was successfully created
Adding new key to key file.
The new key and certificate request were created successfully.
Press ENTER to continue
```

4. Make the newly created key the default.

   After the key and certificate have been created, the Key menu will be displayed. The newly created key will be listed as the Selected Key Entry:

```
Key Menu
Currently Selected Key Ring: fwkey.kyr
Selected Key Entry:  Firewall Key

L - List/Select a Key To Work With
S - Show Information about Selected Key
D - Delete Selected key
C - Create a New Key and Certificate Request
I - Import a Key From an Armored Key File
E - Export Selected Key To an Armored Key File
F - Make Selected Key the Default Key for this Key Ring
U - Unmark Selected Key's Trusted Root Status
R - Create A Certificate Request for Selected Key
X - Exit This Menu

Enter a command: f
```

   You must make the newly created key the default key in the key file. Enter 'f' as shown in the previous example. You will be prompted to confirm the action:

```
Key Menu
Currently selected key: Firewall Key
Are you sure you want to make this key the default?
Enter Y for yes or N for No:
y
Key was made the default key.
Press ENTER to continue
```

   After the key has been marked as the default, the Key Menu is displayed:

```
Key menu
Currently Selected Key Ring: fwkey.kyr
Selected Key Entry: Firewall Key

L - List/Select a Key To Work With
S - Show Information about Selected Key
D - Delete Selected key
C - Create a New Key and Certificate Request
I - Import a Key From an Armored Key File
E - Export Selected Key To an Armored Key File
F - Make Selected Key the Default Key for this Key Ring
U - Unmark Selected Key's Trusted Root Status
R - Create A Certificate Request for Selected Key
X - Exit This Menu

Enter a command: x
```

   Exit the Key menu by entering 'x'.

5. Receive the certificate into the key ring file.

   The Key Ring menu will be displayed:

```
Key Ring Menu
Currently Selected Key Ring: fwkey.kyr

N - Create New Key Ring File
```

```
O - Open Key Ring File
S - Save Key Ring File
A - Save Key Ring as Another File
P - Set Password for Key Ring File
C - Create Stash File for Key Ring File
R - Receive a Certificate into a Key Ring File
W - Work with Keys and Certificates
X - Exit

Enter a command: r
```

Note: Since the firewall does not use SSL for authentication purposes, your certificate does not have to be signed by a certificate authority.

```
Enter file name or press ENTER for Cert.txt.
fwkey.cert
This is a self-signed certificate. Add it to the key file?
Enter Y for yes or N for no:
y
Certificate added to key ring.
Press ENTER to continue
```

6. Create a stash file for the key file.

   After the certificate has been added to the key ring, the Key Ring Menu is displayed:

```
Key Ring Menu
Currently Selected Key Ring: fwkey.kyr

N - Create New Key Ring File
O - Open Key Ring File
S - Save Key Ring File
A - Save Key Ring as Another File
P - Set Password for Key Ring File
C - Create Stash File for Key Ring File
R - Receive a Certificate into a Key Ring File
W - Work with Keys and Certificates
X - Exit

Enter a command: c
```

   You need to create a stash file for the key file. Enter 'c' as shown in the previous example. MKKF will use the same base name as the key file name and .sth as the extension:

```
Stashed password file saved to fwkey.sth
Press ENTER to continue
```

   After the stash file has been created, the Key Ring Menu is displayed:

```
Key Ring Menu
Currently Selected Key Ring: fwkey.kyr

N - Create New Key Ring File
O - Open Key Ring File
S - Save Key Ring File
A - Save Key Ring as Another File
P - Set Password for Key Ring File
C - Create Stash File for Key Ring File
R - Receive a Certificate into a Key Ring File
W - Work with Keys and Certificates
X - Exit

Enter a command: x
```

Your key file is now ready to be used. Enter 'x' as shown above to exit MKKF and enter 'y' to save changes to your key file as shown:

```
Key ring file has been changed. Save?
Enter Y for yes or N for no:
y
Key ring saved to fwkey.kyr
Press ENTER to continue
#
```

7. Updating the configuration file.

   After exiting the MKKF, check the file permissions on your key file, stash file and certificate file.

   For security reasons, these files should be owned by root. If the files are not owned by root, change the owner using this command:

   ```
   #ls -l fwkey*
   -rw-r--r-- 1 root security 1025 Mar 18 10:01 fwkey.cert
   -rw------ 1 root security 3682 Mar 18 10:10 fwkey.kyr4
   -rw------ 1 root security  129 Mar 18 10:09 fwkey.sth
   ```

   After creating the key file, you must specify the key file name in the configuration server parameter file using the `fwcfgsrv` command.

   If you are using SSL encryption for the configuration server, you also need to set the encryption=ssl option using the `fwcfgsrv` command.

   Note: This line does not have to be changed if you are using the key file only for IPSec.

The SSL key life span is one year.

Appendix A. Messages

This appendix contains messages for the IBM Firewall for AIX, the IBM Firewall for NT, and messages that are common to both firewalls. It also gives you the following information about the IBM Firewall messages :

- How the messages are formatted
- The messages' severity levels
- The messages and their explanations

Message Tag

ICA The first 3 fixed bytes.

xxxx A number in the range 0000 – 9999.

a An indicator of severity. Messages are classified by severity level.

- i – info
- w– warning
- e – error
- s – severe

Messages

ICA0001 **ALERT -** *count* **authentication failures.**

Explanation: Threshold conditions for authentication failures have been satisfied.

ICA0002 **ALERT -** *count* **authentication failures for user** *user_name***.**

Explanation: Threshold conditions for detecting a specific log message have been satisfied.

ICA0003 **ALERT -** *count* **authentication failures from host** *host IP address***.**

Explanation: Threshold conditions for authentication failures from any specific host have been satisfied.

ICA0004 **ALERT - Tag** *message_id* **with** *count* **log entries.**

Explanation: Threshold conditions for detecting a specific log message have been satisfied.

ICA0005 **Log monitor - out of memory.**

Explanation: Process ran out of memory.

ICA0006 **Log monitor - failure accessing services file:** *errno*

Explanation: Could not find entry for fwlogmond in /etc/services.

ICA0007 **Log monitor - socket creation failed:** *errno*

Explanation: Could not open socket - see error message.

ICA0008 **Log monitor - bind() failed:** *errno*

Explanation: Could not bind socket - see error message.

ICA0009 **Could not open threshold definition file:** *errno*

Explanation: Problem accessing threshold definition file - see error message.

ICA0010 **Log monitor - fatal read error:** *errno*

Explanation: Problem reading from socket - see error message.

ICA0011 **Could not get status of threshold definition file:** *errno*

Explanation: Problem accessing threshold definition file - see error message.

ICA0012 **Log monitor daemon shutting down.**

Explanation: Daemon is abending or received terminate signal. Previous log messages would provide detail.

ICA0013 **Log monitor caught terminate signal.**

Explanation: Daemon received terminate signal and will shut down.

ICA0014 **Starting log monitor daemon.**

Explanation: Daemon has been started.

ICA0015 **Could not create daemon for log monitor:** *errno*

Explanation: Daemon creation failed - see error message.

ICA0016 **Could not open** *process id file* **- daemon may already be active.**

Explanation: Daemon could not open process id file.

ICA0017 **Could not write process id (***process id***) to** *file***.**

Explanation: Daemon could not write process id to the file.

ICA0018 **Log monitor - empty read.**

Explanation: Received packet with no data - discarded.

ICA0019 **Log monitor - short read. Tag discarded.**

Explanation: Received packet with not enough data - discarded.

ICA0020 **Log monitor - misformatted ICA tag.**

Explanation: Received packet with misformatted data - discarded.

ICA0021 **Log monitor - misformatted authentication data.**

Explanation: Received packet with misformatted data - discarded.

ICA0022 **Invalid syntax in threshold definition file (***invalid entry***).**

Explanation: The indicated entry in the threshold file is syntactically incorrect.

ICA0023 **Can not open fwmail.conf file.**

Explanation: open on fwmail.conf file failed or file is empty

ICA0024 **Can not Connect to SMTP Server.**

Explanation: SMTP Server is busy or is refusing connection

ICA0025 **Alert Message Email failed.**

Explanation: Could not email log monitor alert message to specified address.

ICA0051 **Days to keep in log file,** *log file name***, must be unsigned short integer value.**

Explanation: Days to keep in log file must be a valid integer.

ICA0052 **Days to keep in archives,** *log file name***, must be unsigned short integer value.**

Explanation: Days to keep in archives must be a valid integer.

ICA0053 **Multiple entries for the log file,** *log file name***, in the logmgmt.cfg is not alloweded.**

Explanation: Multiple entries for a log file in the logmgmt.cfg is not alloweded.

ICA0054 **Can not open** *file name* **file.**

Explanation: Unable to open the named file.

ICA0055 **There is no valid entry in logmgmt.cfg file.**

Explanation: There is no valid entry in logmgmt.cfg file.

ICA0056 **The log message,***"message text"***, is invalid**

Explanation: The text shown is not a valid log message.

ICA1001 Unable to create file with our process id

Explanation: Filter logging daemon encountered an error when writing the file fwlogd.pid.

User Response: Check the file system where directory /etc/security resides. Possible out-of-space condition exists.

ICA1002 Communications with cfgfilt program not possible

Explanation: Due to the fwlogd.pid file not being created, communication between the fwlogd daemon and the cfgfilt application (required for filter control) is not possible.

User Response: Check the file system where directory /etc/security resides. Possible out-of-space condition exists.

ICA1003 Continuing with logging daemon initialization

Explanation: The fwlogd daemon will continue start-up processing.

ICA1004 Filter logging daemon *fwlogd* **(level** *version.release***) initialized at** *time* **on** *date*

Explanation: The IP packet logging daemon has been started. When/if packet logging is enabled daemon fwlogd will write the required records to the syslog, local4, file.

ICA1005 Suppressed logging of *filter_rule_no* **packet message(s) due to buffer overflow**

Explanation: The fwlogd daemon filter log buffer has overflowed. A packet for the specified filter rule cannot be logged.

User Response: Check the log. Your firewall may be under a denial-of-service attack or you may be logging messages which are not required. For example, broadcast messages should have a deny rule with log control set to no (l=n) to prevent filling up the log.

ICA1006 Fatal fwlogd error - *failing function***:** *error message*

Explanation: The fwlogd server failed in the indicated function, daemon terminated.

User Response: Correct the indicated system problem and restart fwlogd.

ICA1007 Unable to fork child process: *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

User Response: Based on the error displayed, take corrective action.

ICA1008 Error return from setpgrp routine: *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1009 Unable to fork second child process: *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1010 This daemon must run with root authorization

Explanation: The filter logging daemon must be started under root authority.

User Response: Restart with root authority.

ICA1011 sysconfig call to query kernel extension *load_path* **failed:** *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1012 AIX kernel extension *netinet* **not loaded -- can't continue**

Explanation: The **netinet** device driver does not contain filter support.

User Response: Install the Firewall code. Potentially, the code has been installed but the *reboot* has not been performed.

ICA1013 Socket creation call failed: *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1014 AIX netinet device driver not at required level

Explanation: The netinet device driver and fwlogd daemon are not the same level.

User Response: Resolve the conflict, possible reboot required after installing new Firewall level.

ICA1015 **Error on ioctl() call (SIOCGFWLOG):** *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1016 **Can't get current deferred log queue**

Explanation: Additional information associated with immediately preceding log message.

ICA1017 **Error return from SIOCGFWLOG ioctl() call**

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1018 **Fatal fwlogd error -** *failing function***:** *system error message*

Explanation: The fwlogd server failed in the indicated function, daemon terminated.

User Response: Correct the indicated system problem and restart fwlogd.

ICA1019 **Unexpected error exit with rc** *internal_fw_return_code*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

ICA1020 **Fatal fwlogd error -** *failing function***: return code = 0x***function return code*

Explanation: The fwlogd server failed in the indicated function, daemon terminated.

User Response: Correct the indicated system problem and restart fwlogd.

ICA1021 **Error on open** */dev/ipsp_poif***:** *errno*

Explanation: The indicated device driver has not been installed.

User Response: If the Firewall code has been installed, check the /tmp/rc/net.out file for possible error messages.

ICA1022 **Filter support verification failed**

Explanation: Due to an error recorded prior to this message, filter support cannot be verified.

ICA1023 **Error on ioctl() call (SIOCGFWLVL):** *errno*

Explanation: During startup of the filter logging daemon, the indicated system error was encountered.

User Response: Do one of the following:

- For AIX: :p.Verify the correct level of the Firewall netinet device driver has been installed and the machine has been rebooted since the installation.
- For OS/390: :p.Verify the correct level of TCP/IP has been installed and has been started with the **IPCONFIG FIREWALL** configuration statement.

ICA1024 **Error writing file** */etc/security/fwlogd.pid***:** *errno*

Explanation: Due to the indicated system errno, fwlogd was unable to write the specified file.

User Response: Correct the indicated problem and restart the filter logging daemon.

ICA1032 **Filter rules updated at** *time* **on** *date*

Explanation: IP packet filtering rules have been updated.

ICA1033 **Filter support (level** *version***.***release***) initialized at** *time* **on** *date*

Explanation: Firewall filter support has been initialized.

ICA1034 **Filter support deactivated at** *time* **on** *date*

Explanation: IP packet filtering now using default filter rules rather than those defined in /etc/security/fwfilters.cfg file.

ICA1035 **Status of packet logging set to** *enabled/disabled* **at** *time* **on** *date*

Explanation: Status of packet logging has changed. Message indicates current state with time stamp.

ICA1036 *#:rule_noR: rule_type direction: interface s:src_addr d: dst_addr p: protocol tag: scr_port/icmp_type tag: dst_port/icmp_code r:routed/local a: secure/non_secure f:yes/no T:tunnel_id e:C/D/n l:packet_length*

Explanation: Log record indicating a processed IP packet and the corresponding filter rule it matched. For this record to be written, the matched filter rule must have log control set to *yes*. If the IP packet which matched this rule is a fragment, the ports/icmp type/code information appears for the header packet but is shown as zero for packets other than the header packet.

ICA1037 *#:rule_no action src_addr src_mask dst_addr dst_mask protocol logical_op value logical_op value interface_type routing directionl= log_control f=fragment_controlt= tunnel_ID enc_alg auth_alg*

Explanation: When filters rules are updated, the activated rules are written to the log. This log message describes one of the activated rules.

ICA1038 **Session Key engine started, using session socket port:***port_no* **and master socket port:***port_no*

Explanation: Encryption tunnel started using specified UDP port numbers, as defined in /etc/services.

ICA1039 **Policy being (re)defined as:**

Explanation: Policy cache being (re)defined using file /etc/security/fwpolicy. Following lines show the new policy cache.

ICA1040 **>Policy statement:** *tunnel_origin tunnel_end tunnel_ID encrypt_flag/authenticate_flag*

Explanation: Line logged was read from the /etc/security/fwpolicy file.

ICA1041 **Context specification deleted for tunnel:***tunnel_ID*

Explanation: The tunnel context, for the listed ID, is no longer operational.

ICA1042 **The following tunnel context specification(s) is defined:**

Explanation: Tunnel context specifications are being defined, as listed on the following log records.

ICA1043 **>tunnel_ID:***number***, src_addr:***IP_address***, dst_addr:***IP_address***, encryption:***algorithm*

Explanation: Message lists specific attributes of activated tunnel context.

ICA1044 **Host Counter Warning: IP(***IP Address***) Overlimit**

Explanation: There are too many secure hosts trying to connect with the Firewall machine

System Action: pass connections

ICA1045 **TCP Overlimit:** *IP Address***(***Port***)->***IP Address***(***Port***) rejected**

Explanation: There are too many TCP sessions through the Firewall machine

System Action: reject connections

ICA1046 **UDP Overlimit:** *IP Address***(***Port***)->***IP Address***(***Port***) rejected.**

Explanation: There are too many UDP sessions through the Firewall machine

System Action: reject connections

ICA1047 **Grace Period Warning : too many TCP sessions,***IP Address***(***Port***)->***IP Address***(***Port***) passed**

Explanation: There are too many TCP sessions through the Firewall machine

System Action: pass connections

ICA1048 **Grace Period Warning : too many UDP sessions,***IP Address***(***Port***)->***IP Address***(***Port***) passed**

Explanation: There are too many UDP sessions through the Firewall machine

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ICA1049 **Invalid ipsec package: s:***IP Address* **d:***IP Address* **protocol:***Protocol* **spi:***Security Parameters Index*

Explanation: The ipsec package cannot be decapsulated by the receiving firewall.

User Response: Ensure that the tunnel definition has been exported correctly and has been activated on each firewall.

ICA1050 **Specification deleted for tunnel:***tunnel_ID*

Explanation: The tunnel specification, for the listed ID, is no longer operational.

ICA1051 **The following tunnel specification(s) is defined:**

Explanation: Tunnel specifications are being defined, as listed on the following log records.

ICA1052 **>tunnel_ID:***number*, **src_addr:***IP_address*, **dst_addr:***IP_address*, **src_enc:***algorithm* **rem_enc:***algorithm* **src_mac:***algorithm* **rem_mac:***algorithm* **src_enc_mac:***algorithm* **rem_enc_mac:***algorithm* **src_pol:***policy* **rem_pol:***policy* **mode:***transport_mode*

Explanation: Message lists specific attributes of activated tunnel.

ICA1053 **Resource allocation failure: error type is** *number*

Explanation: Key Recovery encountered a problem allocating some resource. Values for number are defined as follows: 1 : Memory allocation failure. 2 : IPSec is not loaded. 3 : The tunnel does not exist. 5 : No KRB needed.

ICA1054 **Communication error: error type is** *number*

Explanation: Key Recovery encountered a communications problem. Values for number are defined as follows: 1-7 : Communications problems. Check if krbpingd is running. 8-10 : Received an illegal request; it will be ignored.

ICA1055 **SCCS internal error: error type is** *number*

Explanation: An error occurred in the Key Recovery code. Values for number are defined as follows: 1-4 : Problems with crypto service provider. Have you installed SCCS? 5-7 : Problems with key recovery service provider. Have you installed KRSP? 8 : Initialization failed. 9-14 : SCCS internal error.

ICA1056 **Timeout failure: error type is** *number*

Explanation: A response was not received in the allotted time. Values for number are defined as follows: 1 : Failed to receive response from remote end. Check connectivity. 2 : Failed to receive response from krbpingd. Is it running?

ICA1057 **Resource allocation failure for tunnel-id:** *tunnel-id***: error type is** *number*

Explanation: Key Recovery encountered a problem allocating some resource. Values for number are defined as follows: 1 : Memory allocation failure. 2 : IPSec is not loaded. 3 : The tunnel does not exist. 5 : No KRB needed.

ICA1058 **Communication error for tunnel-id:** *tunnel-id***: error type is** *number*

Explanation: Key Recovery encountered a communications problem. Values for number are defined as follows: 1-7 : Communications problems. Check if krbpingd is running. 8-10 : Received an illegal request; it will be ignored.

ICA1059 **SCCS internal error for tunnel-id:** *tunnel-id***: error type is** *number*

Explanation: An error occurred in the Key Recovery code. Values for number are defined as follows: 1-4 : Problems with crypto service provider. Have you installed SCCS? 5-7 : Problems with key recovery service provider. Have you installed KRSP? 8 : Initialization failed. 9-14 : SCCS internal error.

ICA1060 **Timeout failure for tunnel-id:** *tunnel-id***: error type is** *number*

Explanation: A response was not received in the allotted time. Values for number are defined as follows: 1 : Failed to receive response from remote end. Check connectivity. 2 : Failed to receive response from krbpingd. Is it running?

ICA1061 **TC_LOG***number***: Tunnel interface module for IPv***number* **was started at** *time* **on** *date*

Explanation: IPSEC: Tunnel interface module was started.

ICA1062 **TC_LOG***number***: Tunnel interface module for IPv***number* **was shutdown at** *time* **on** *date*

Explanation: IPSEC: Tunnel interface module was shutdown.

ICA1063 **TC_LOG***number***: Tunnel cache module for IPv***number* **was started at** *time* **on** *date*

Explanation: IPSEC: Tunnel cache module was started.

ICA1064 **TC_LOG***number***: Tunnel cache module for IPv***number* **was shutdown at** *time* **on** *date*

Explanation: IPSEC: Tunnel cache module was shutdown.

ICA1065 **TC_LOG***number***: Tunnel** *number* **with ESP SPI** *number* **and AH SPI** *number* **for IPv***number* **was activated at** *time* **on** *date*

Explanation: IPSEC: tunnel is activated

System Action: Establish a tunnel.

ICA1066 **TC_LOG***number*: **Tunnel** *number* **with ESP SPI** *number* **and AH SPI** *number* **for IPv***number* **was deactivated at** *time* **on** *date*

Explanation: IPSEC: tunnel is deactivated

System Action: Close a tunnel.

ICA1067 **TC_LOG***number*: **Tunnel cache for IPv***number* **was cleared at** *time* **on** *date*

Explanation: IPSEC: a tunnel is cleared from tunnel cache

System Action: Tunnel cache is updated

ICA1068 **TC_LOG***number*: **Tunnel** *number* **not found at** *time* **on** *date*

Explanation: IPSEC: tunnel is not available

ICA1069 **TC_LOG***number*: **Tunnel cache entry not found. src addr=***IP-address*,**dst addr=***IP-address*,**SPI=***number*,**tunnel id=***number* **at** *time* **on** *date*

Explanation: IPSEC: tunnel entry is not available in cache

ICA1070 **TC_LOG***number*: **AH failure. src addr=***IP-address*,**dst addr=***IP-address*,**SPI=***number*,**flow id=***number* **at** *time* **on** *date*

Explanation: IPSEC: AH failure.

ICA1071 **TC_LOG***number*: **ESP failure. src addr=***IP-address*,**dst addr=***IP-address*,**SPI=***number*,**flow id=***number* **at** *time* **on** *date*

Explanation: IPSEC: ESP failure.

ICA1072 **TC_LOG***number*: **Tunnel expired. src addr=***IP-address*,**dst addr=***IP-address*,**ESP SPI=***number*,**AH SPI=***number*,**tunnel id=***number* **at** *time* **on** *date*;

Explanation: IPSEC: Tunnel expired.

ICA1200 **Terminating logging daemon due to above errors**

Explanation: Due to errors recorded prior to this message, fwlogd daemon is terminating.

System Action: IP filter logging will not be activated.

User Response: Correct indicated errors and restart fwlogd.

ICA1260 **Filter logging daemon terminating at** *time* **on** *date* **due to receipt of** *termination* **signal**

Explanation: The fwlogd daemon received the indicated termination signal and is stopping.

ICA1305 **Unknown protocol specification.**

Explanation: In formatting an IP packet for syslog, a record was found with an unknown protocol specification. Protocols IP, ICMP, TCP, UDP and IPSP are the recognized protocols. Note IPSP is IBM's designation for the encrypted packets passed through a tunnel.

ICA1400 **Fatal fwtimernat error -** *failing function*: *system error message*

Explanation: The fwtimernat server failed in the indicated function. The fwtimernat server was terminated.

User Response: Correct the indicated system problem and restart fwtimernat.

ICA1401 **Fatal fwtimernat error -** *failing function*: **return code = 0x***function return code*

Explanation: The fwtimernat server failed in the indicated function. The fwtimernat server was terminated.

User Response: Correct the indicated system problem and restart fwtimernat.

ICA1402 **Fatal fwtimernat error -** *failing function*: *error message*

Explanation: The fwtimernat server failed in the indicated function. The fwtimernat server was terminated.

User Response: Correct the indicated system problem and restart fwtimernat.

ICA2000 **New FTP session to** *IP_address* **from** *IP_address* **(non-secure site).**

Explanation: Starting a new ftp session from non-secure site.

ICA2001 **Authentication failed for user** *name* **(unknown) from** *net ftp*:*IP_address*.

Explanation: A user, without an account, attempted to use ftp proxy from the network.

User Response: See your firewall administrator to setup a proxy account.

ICA2002 **Authentication failed for user** *name* **with** *authentication method* **from** *network*:*host name*.

Explanation: Firewall is unable to authenticate the indicated user name using the specified authentication method.

User Response: See your Firewall administrator.

ICA2003 **No shells configured for** *user name*.

Explanation: The identified user attempted a proxy login and no login shell has been defined.

User Response: See your Firewall administrator to correct this user login profile.

ICA2004 **Unknown audit event of 0x***hex_value* **received.**

Explanation: An unknown audit request was received by the module tcpip_audit.c.

ICA2005 **Error writing to client:** *errno*.

Explanation: Unable to communicate with client, see logged system message.

ICA2006 **ptelnetd: auditproc:** *errno*.

Explanation: Indicated error returned by telnet audit process. Potential corruption of system files.

ICA2007 **ptelnetd: panic state=***value*.

Explanation: Unknown error detected. Potential corruption of system files.

ICA2008 **Non-firewall user** *name* **from :***IP_address* **telneted in.**

Explanation: A user, without a firewall account, attempted to use telnet proxy.

System Action: Assume Generic Authentication used.

ICA2009 **/bin/login:** *errno*.

Explanation: Fatal error during system login. See indicated system error message.

ICA2010 **Connect to** *IP_address* **from** *IP_address* **(non-secure).**

Explanation: Successful connection between indicated IP addresses through the non-secure interface.

ICA2011 **Connect to** *IP_address* **from** *IP_address* **(secure).**

Explanation: Successful connection between indicated IP addresses through the secure interface.

ICA2012 **New FTP session to** *IP_address* **from** *IP_address* **(secure site).**

Explanation: Starting a new ftp session.

ICA2013 **New Telnet session to** *IP_address* **from** *IP_address*.

Explanation: New telnet session established.

ICA2014 **Option** *value* **not supported.**

Explanation: The indicated flag is not supported, see preceding message.

ICA2015 **Option -***value* **not supported.**

Explanation: The indicated flag is not supported, see preceding message.

ICA2016 **Remote user-id:** *name*.

Explanation: ftp connection request for indicated user.

ICA2017 **Debug** - *in line*.

ICA2018 **SNK key not found for user** *name*.

Explanation: SecureNetKey value was not found for indicated user_ID.

User Response: See your Firewall administrator for possible login configuration problem.

ICA2019 **SNK key not read properly for user** *name*.

Explanation: SecureNetKey value was not readable as octal digits for indicated user_ID.

User Response: See your Firewall administrator for possible login configuration problem.

ICA2020 **/usr/bin/fwuserau or /usr/bin/fwuserpt do not exist.**

Explanation: Authentication using user-supplied authentication method is aborted.

System Action: Authentication is aborted.

User Response: Make sure that /usr/bin/fwuserau and /usr/bin/fwuserpt exist and the owner is the root. If the executable does not exists, user should make an executable using a compiler compatible with the operation system of the firewall and name it

/usr/bin/fwuserau or name it /usr/bin/fwuserpt.

ICA2021 **Trying to connect to remote host** *name* **with user-id** *name***.**

Explanation: Trying to establish a new ftp connection.

ICA2022 **Trying to connect to remote host** *name***.**

Explanation: Trying to establish a new ftp connection.

ICA2023 **Usage: ptelnetd [-n] [-s].**

Explanation: Unknown flag specified when starting the ptelnet daemon.

User Response: Use only flags -n and/or -s.

ICA2024 **User** *name* **successfully authenticated using** *method* **authentication from** *network***:***host name***.**

Explanation: FW authenticated the indicated user name using the specified authentication method.

ICA2025 **User** *name* **logged in using** *method* **authentication from** *network* **:***host name***.**

Explanation: ftp user logged in.

ICA2026 **User** *name* **timed out after** *n* **seconds at** *current time***.**

Explanation: Connection attempt timed out for specified user. Potential network routing problem or remote host is not available.

ICA2027 **Connection from** *remote host* **at** *time***.**

Explanation: Net ftp connection established to Firewall.

ICA2028 **FTP connection attempt to** *IP_address* **from** *IP_address* **refused. This machine does not support FTP from non-secure site.**

Explanation: Generally indicates an attempt to establish an ftp connection to Firewall across the non-secure interface.

System Action: Reject the connection.

ICA2029 **System error with errno =** - **in** *in* **line** *line***.**

Explanation: The system call encounters a problem while executing a system call.

System Action: System execution halted

User Response: get the log, find out the meaning of errno try to resolve the problem. If cannot be resolved, contact IBM service.

ICA2030 **Function call with return code =** - **in** *in* **line** *line***.**

Explanation: The function call encounters a problem.

System Action: Error returned

User Response: get the log, find out the meaning of return code try to resolve the problem. If cannot be resolved, contact IBM service.

ICA2031 **sdi function call creadcfg() rc =** -**.**

Explanation: The function call encounters a problem.

System Action: Error returned

User Response: consult the sdi reference for explanation.

ICA2032 **Lost connection.**

Explanation: Lost ftp connection.

User Response: Reestablish session.

ICA2033 **sdi function call sd_init rc =** -**.**

Explanation: The function call encounters a problem.

System Action: Error returned

User Response: consult the sdi reference for explanation.

ICA2034 **sdi function call sd_check rc =** -**.**

Explanation: The function call encounters a problem.

System Action: Error returned

User Response: consult the sdi reference for explanation.

ICA2035 **setsockopt():** *errno***.**

Explanation: System error on setsocketopt call.

ICA2036 **Telnet Session** *session id* **started for user** *user id* **(***source IP addr***:***dest IP addr***).**

Explanation: Message generated at the start of each Telnet session. A session begins when userid, source ip and destination ip are all known to the firewall. The session id is a unique identifier generated by the firewall.

ICA2037 **User fwdfuser or fwdpuser tried to login, is not allowed.**

Explanation: fwdfuser and fwdpuser are reserved users and should not be used.

System Action: Login is refused.

User Response: The administrator should investigate who is using this user.

ICA2038 **ttloop: peer died:** *errno*.

Explanation: Error occurred while flushing the network output buffer. Appears that peer process has died.

ICA2039 **ttloop: read:** *errno*.

Explanation: Error occurred while flushing the network output buffer.

ICA2040 **Authentication set to password or none is not allowed for user ID fwdfuser.**

Explanation: fwdfuser is a reserved user ID and should not use password or n none as the authentication method.

System Action: Login is refused.

User Response: The administrator should change the authentication method for user ID fwdfuser.

ICA2041 **FTP session** *session id* **started for** *user id* **(***source IP addr***:***dest IP addr***).**

Explanation: Message generated at the start of each FTP session. A session begins when userid, source ip and destination ip are all known to the firewall. The session id is a unique identifier generated by the firewall.

ICA2042 **req_rsp_code is incorrectly set to FW_AUTH_REQ.**

Explanation: fw_tn_authenticate is not allowed to set req_rsp_code to FW_AUTH_REQ.

System Action: Abort the authentication.

User Response: Change fw_tn_authenticate, make the library fwuser.o again, and put it into the Firewall.

ICA2043 **Could not get password for** *user_name*.

Explanation: Authentication type for this user is 'password' and no password was found.

User Response: See your Firewall administrator.

ICA2044 **Incorrect time (***value***) specified for -t.**

Explanation: The time value shown contains characters outside the numeric range of 0..9 or exceeds the maximum allowed value.

ICA2045 **Option -T not supported on firewall.**

Explanation: Indicated option is not supported.

ICA2046 **Option -k not supported on firewall.**

Explanation: Indicated option is not supported.

ICA2047 **Option -s not supported on firewall.**

Explanation: Indicated option is not supported.

ICA2048 **Option -u not supported on firewall.**

Explanation: Indicated option is not supported.

ICA2049 **Unknown flag -***value* **ignored.**

Explanation: Indicated flag was specified and is not recognized.

ICA2050 **Unknown parm** *value*.

Explanation: Indicated value, specified as an option, is not recognized.

ICA2051 **adapt_addr conversion error on address.**

Explanation: IP address shown is not valid.

User Response: Possible corruption of the file /etc/security/fwsecadpt.cfg. Remove the file, reconfigure your secure interface(s) and reinitialize the filters.

ICA2052 **afopen failed to open /etc/security/login.cfg:** *errno*.

Explanation: Unable to authenticate user, open error on indicated file.

ICA2053 **Could not open secure interface file.**

Explanation: A secure interface has not been configured.

User Response: If a secure interface should be defined, use Firewall commands/smit panels to define the secure interface(s).

ICA2054 **enduserdb rc=*value*, *errno*.**

Explanation: Received indicated system error code attempting to retrieve user login profile information.

User Response: See your Firewall administrator to verify your login account.

ICA2055 **getpeername() (*invocation name*): *errno*.**

Explanation: System error when ftp daemon attempted to get socket name.

ICA2056 **getsockname() (*invocation name*): *errno*.**

Explanation: System error when ftp daemon attempted to get port name.

ICA2057 **getuser non-secure shell rc=*value* for *user_ID*, *errno*.**

Explanation: Received indicated system error code attempting to retrieve shell name for connection from non-secure side of Firewall.

User Response: See your Firewall administrator to set a shell for your user login profile.

ICA2058 **getuser secure shell rc=*value* for *user_ID*, *errno*.**

Explanation: Received indicated system error code attempting to retrieve shell name for connection from secure side of Firewall.

User Response: See your Firewall administrator to see a shell for your user login profile.

ICA2059 **ioctl(): *errno***

Explanation: System error on ioctl() call for SIOCSPGRP.

ICA2060 **ptelnetd: ftok for shared memory failed.**

Explanation: Unable to allocate shared memory segment.

User Response: Contact the Firewall administrator, apparent memory problem.

ICA2061 **ptelnetd: shmat for shared memory failed.**

Explanation: Unable to allocate shared memory segment.

User Response: Contact the Firewall administrator, apparent memory problem.

ICA2062 **ptelnetd: shmget for shared memory failed.**

Explanation: Unable to allocate shared memory segment.

User Response: Contact the Firewall administrator, apparent memory problem.

ICA2063 **setsockopt() (SO_DEBUG): *errno*.**

Explanation: Indicated error message returned from system call 'setsockopt'.

ICA2064 **setsockopt() (SO_KEEPALIVE): *errno*.**

Explanation: Indicated error message returned from system call 'setsockopt'.

ICA2065 **setuser rc=*value*, *errno*.**

Explanation: Received a bad return code on a system call for the indicated reason.

ICA2066 **signal(): *errno*.**

Explanation: System error when ftp daemon attempted to establish signal handler.

ICA2067 **Fatal pftpd initialization error - bind(): *errno***

Explanation: pftpd server initialization failed, daemon terminated. The most likely cause of this error is another ftp daemon already listening on the standard ftp port (21).

User Response: Correct the indicated system problem and restart pftpd.

ICA2068 **Fatal pftpd initialization error - listen(): *errno***

Explanation: pftpd server initialization failed, daemon terminated.

User Response: Correct the indicated system problem and restart pftpd.

ICA2069 **Fatal pftpd error - main accept(): *errno***

Explanation: pftpd server main routine failed, daemon terminated.

User Response: Correct the indicated system problem and restart pftpd.

ICA2070 **Fatal pftpd initialization error - socket(): *errno***

Explanation: pftpd server initialization failed, daemon terminated.

User Response: Correct the indicated system problem and restart pftpd.

ICA2071 **Connection refused, maximum number of connections reached.**

Explanation: The pftpd server cannot create another FTP session because the maximum number of sessions already exist.

System Action: The connection is refused.

User Response: Wait for existing connections to end, then try the request again.

ICA2072 **ftp configuration file (*filename*) is not available.**

Explanation: ftp daemon attempted to open the specified ftp configuration file but it either does not exist or could not be opened.

System Action: ftp daemon processing uses the default configuration

User Response: None, unless the file should exist, in which case it should be created or moved to the location specified in the message.

ICA2073 **Unable to obtain storage for ftp language table.**

Explanation: Storage required to represent a REPLYLANGUAGE statement in the ftp configuration file could not be obtained.

System Action: Processing continues.

User Response: Increase the region size or reduce the entries in the configuration file.

ICA2074 **Processing complete for ftp config statement:** *configuration statement*

Explanation: ftp has processed the indicated configuration statement.

System Action: Processing continues.

User Response: None

ICA2075 **FTP for** *user id* **(***source IP addr***:***dest IP addr***),** *operation file name***,** *numbytes* **bytes. sid:** *session id***.**

Explanation: Message generated for each file transfer on open FTP sessions. The sid is a unique identifier generated by the firewall at session start.

ICA2076 **FTP Session** *session id* **ended for** *user id* **(***source IP address***:***dest IP addr***),** *duration* **seconds,** *numbytes* **bytes.**

Explanation: Message generated at the end of each FTP daemon session. The sid is a unique identifier generated by the firewall at session start.

ICA2077 **Telnet Session** *session id* **ended for** *user id* **(***source IP address***:***dest IP addr***),** *numbytes* **bytes.**

Explanation: Message generated at the end of each Telnet session. The sid is a unique identifier generated by the firewall at session start.

ICA2078 **Disconnected proxy user** *user* **- idle for** *time* **minutes.**

Explanation: User's session has exceeded maximum allowable idle time.

ICA2079 **Attention - Unauthorized connection attempt to** *IP_address* **from** *IP_address***.**

Explanation: Generally indicates an attempt to establish a connection to Firewall across the non-secure interface.

System Action: Reject the connection.

ICA2080 **Syntax error (***reason***) near column** *column* **in ftp configuration file line** *line***:** *configuration statement*

Explanation: The ftp configuration statement at the given line is in error. The reason for the error and the location where the error was detected is provided.

System Action: Statement is ignored.

User Response: Correct the statement in the ftp configuration file.

ICA2081 **No message catalog given by ftp configuration statements is usable.**

Explanation: Attempts to open the message catalogs given by the REPLYLANGUAGE ftp configuration statements failed. No client message catalog can be used.

System Action: Client message catalog is forced to the English language in the C directory.

User Response: Ensure that there are catalog files in each of the directories associated with the language directories in the ftp configuration REPLYLANGUAGE statements. Also check that the NLSPATH environment variable is correctly set to allow substitution of both the sub-directory from the LANG environment variable (%L) and the catalog name (%N).

ICA2082 **Unable to set ftp LANG environment variable to** *sub-directory*, **reason:** *reason*

Explanation: A system error (given by the reason) occurred when the ftp daemon was trying to change the setting of the LANG environment variable to the sub-directory specified.

System Action: Processing continues. Recovery may generate other messages.

User Response: Use the reason given to determine if this is a system error or programming error.

ICA2083 **Unable to open ftp client message catalog in directory:** *sub-directory*, **reason:** *reason*

Explanation: ftp daemon could not open the message catalog in the given sub-directory. The reason given is the errno returned from catopen().

System Action: Processing continues. Recovery may generate other messages.

User Response: Ensure that there is a catalog in the directory associated with the language directory provided. Check that the NLSPATH environment variable is correctly set to allow substitution of both the sub-directory (%L) and the catalog name (%N).

ICA2084 **Forcing ftp client message catalog to English via the C sub-directory.**

Explanation: Due to previously listed errors, the ftp daemon has forced the client message catalog to the English language using the C sub-directory.

System Action: If the language can be forced to the C message catalog processing continues. If it can not, the program exits.

User Response: Correct the error from the previous messages. If the program also existed, create the message catalog in the C sub-directory and set the NLSPATH environment variable correctly.

ICA2085 **Telnet Session ended for pid** *Process id* **(***source IP address***).**

Explanation: Message generated at the end of each Telnet session.

ICA2086 **Misconfigured user file; user** *user* **with no key (***key***).**

Explanation: ftpd found requested user in user file, but could not find key - misconfigured user file.

User Response: use Firewall commands/smit panels to correct this problem.

ICA2087 **ftpd could not find the specified user** *user* **in the user config file.**

Explanation: the username specified has not been configured or the user.cfg file is corrupt.

User Response: use Firewall commands/smit panels to correct this problem.

ICA2088 **ftpd could not open user configuration file.**

Explanation: ftpd made a call to fopen which failed because it could not open the user config file.

User Response: Make sure the user config file (user.cfg by default) is availible; use Firewall commands/smit panels

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ICA2089 **Authorization type from user file (***Authorization type***) did not match any entries in table (struct tab2 authtab[]).**

Explanation: The authorization type of the specified user (returned from user.cfg) does not match any supported types (such as deny,none,sdi,password,etc.)

User Response: Check user.cfg file integrity or configuration; use Firewall commands/smit panels to correct this problem.

ICA2090 **Authentication failed for user '***user name***' from** *client ip* **because KEY=DENY in the user.cfg file.**

Explanation: Authentication failed due to user.cfg file specifications set by the Firewall administrator.

User Response: See your Firewall administrator.

ICA2091 **User '***user name***' not allowed to ftp to the non-secure port (***firewall ip***).**

Explanation: User tried to ftp into the firewall server via a non-secure port (nsp) - all nsp users must have their 'fwnsftp' key properly configured to a valid authorization type (in the user.cfg file).

User Response: Check user.cfg file integrity or configuration; use Firewall commands/smit panels to correct this problem.

ICA2092 **Internal Error: nt_gwauth() failed.**

Explanation: nt_gwauth() normally returns one of three values (AUTHENTICATED,NOT_AUTHENTICATED or DENY) in this case nt_gwauth returned some invaild integer.

ICA2093 **User '*user name*' not allowed to ftp to the secure port (*port number*).**

Explanation: User tried to ftp into the firewall server via a secure port (sp) - all sp users must have their 'fwsftp' key properly configured to a valid authorization type (in the user.cfg file).

User Response: Check user.cfg file integrity or configuration; use Firewall commands/smit panels to correct this problem.

ICA2094 **Login Failed: expected format: PASS <password> after: USER <*user name*>; received: *invalid cmd*.**

Explanation: Authentication failed because the ftp client did not send the expected format (PASS 'password' per RFC959)

User Response: Type "user <username>"; enter correct password. See your Firewall administrator.

ICA2095 **Login Failed: (via method *auth method*) failed authentication of user '*user name*' from *client ip* (client site).**

Explanation: Authentication failed due to an invaild input (by client for specified authentication type) - such as user entered invalid password, etc.

User Response: See your Firewall administrator.

ICA2096 **Authenticated: (via method *auth method*) successful authentication of user '*user name*' from *client ip* (client site).**

Explanation: Authentication succeeded

ICA2097 **httpd --> Starting HTTP proxy server version *HTTP Proxy Version*.**

Explanation: HTTP Proxy for WWW access starting.

ICA2098 **httpd --> Shutting down HTTP proxy server.**

Explanation: HTTP Proxy for WWW access shutting down.

ICA2099 **httpd --> Status: *HTTP Status code* from client *IP address*, who requested <*HTTP GET request*> for *number of bytes* bytes.**

Explanation: Status of client HTTP request for some file thru the proxy. For further information about the "Status" code value, see the HTTP 1.0(RFC 1945) or HTTP 1.1(RFC 2068) documents (or superceding RFCs) available at various sites on the internet, including ds.internic.net.

ICA2100 **Socket address equals zero.**

Explanation: An invalid destination address was found in the local request.

ICA2101 **Socket address family error: *sin_family_type*.**

Explanation: An invalid address family type was found in the local request.

ICA2102 **Error initializing odm: *odmerrno*.**

Explanation: An odm_initialize() error occurred for ODM (Object Data Manager).

ICA2103 **Error setting odm default path: *odmerrno*.**

Explanation: An odm_set_path() error occurred for ODM (Object Data Manager). object class, OCSvhost.

ICA2104 **Error locking odm database: *odmerrno*.**

Explanation: An odm_lock() error occurred for ODM (Object Data Manager).

ICA2105 **Error opening odm object *Customized_Attribute*: *odmerrno*.**

Explanation: An odm_open_class() error occurred for ODM (Object Data Manager).

ICA2106 **Error searching odm object *OCS_virtual_host*: *odmerrno*.**

Explanation: An odm_get_first() error occurred for ODM (Object Data Manager). object class, OCSvhost.

ICA2107 **Error closing odm object *OCS_virtual_host*: *odmerrno*.**

Explanation: An odm_close_class() error occurred for ODM (Object Data Manager). object class, OCSvhost.

ICA2108 **Error unlocking odm database: *odmerrno*.**

Explanation: An odm_unlock() error occurred for ODM (Object Data Manager).

ICA2109 **Error terminating odm: *odmerrno*.**

Explanation: An odm_terminate() error occurred for ODM (Object Data Manager).

ICA2110 **Error getting server by name: *errno*.**

Explanation: An getservbyname() error occured. The host Login Monitor service, lm, is not specified properly in the /etc/services file.

ICA2111 byname() error: *errno*.

Explanation: An gethostbyname() error occured. The host machine name is not specified properly in /etc/hosts.

ICA2112 Invalid protocol name: *protocol_name*.

Explanation: The protocol name specified in the ODM object class, OCSvhost, is is not supported.

ICA2113 Error opening socket to LM: *errno*.

Explanation: A socket() error occurred to host machine where the Login Monitor resides.

ICA2114 Error binding local address: *errno*.

Explanation: A bind() error using the local address for this OCS node.

ICA2115 Error connecting socket to LM: *errno*.

Explanation: A connect() error occurred to the host machine where the Login Monitor resides.

ICA2116 Protocol type error: *protocol_type*.

Explanation: The virtual terminal protocol type used to communicate with the host Login Monitor is invalid.

ICA2117 Malloc error on LM message.

Explanation: A malloc() error occurred when dynamically allocating space for the variable-length Login Monitor message.

ICA2118 Error transmitting msg to LM: *errno*.

Explanation: A send() error occurred when sending Login Monitor a request to open the correct host device.

ICA2119 Error receiving msg from LM: *errno*.

Explanation: A recv() error occurred when Login Monitor returns an acknowledgement.

ICA2120 Status error from LM: *status*.

Explanation: The acknowledgement from Login Monitor indicates that host device was NOT successfully opened.

ICA2121 Error opening OCS administration device: *errno*.

Explanation: The OCS administration device was not successfully opened.

ICA2122 Failed coverting IP address to TBM ID: *errno*.

Explanation: ioctl() OCS_GET_TBMID error occurred. ioctl command OCS_GET_TBMID failed on the OCS administration device.

ICA2123 Error Connectting TBM determined by rlogin: *errno*.

Explanation: ioctl() OCS_IS_TBM_CONNECTED error occurred. ioctl command OCS_IS_TBM_CONNECTED failed on the OCS administration device.

ICA2124 No host nodes are connected: *errno*.

Explanation: There are no host nodes connected to this OCS node from the list of possible host nodes.

ICA2125 Error getting list for ODM(Object Data Manager): *Customized_Attribute*: *odmerrno*.

Explanation: An odm_get_list() error occurred for ODM object class, CuAt(Customized Attribute).

ICA2126 No OCS host node name associated with: *hostnode_to_connect*.

Explanation: The CuAt(Customized Attribute) entry was found but there was no hostnode/ocsnode match.

ICA2127 Malloc error on Host array.

Explanation: A malloc() error occurred when dynamically allocating space for the array of possible host names.

ICA2128 User (unknown) from *client ip* **(client site) attempted a command '***invalid command***' before authentication.**

Explanation: A user attempted actions before entering in username and password for authentication - users must first be authenticated before any further processing may continue.

User Response: Please login with USER and PASS

ICA2129 gethostbyname (*invocation name***):** *errno*

Explanation: System error when ftpd attempted to get host information corresponding to the host name.

ICA2130 User (*username***) from** *client ip* **(client site) attempted a command '***invalid command***' .**

Explanation: Specified user attempted invalid command.

User Response: Only commands USER, QUOTE SITE

and QUIT are allowed until you specify "quote site destination".

ICA2131 **Authentication failed for user '***user name***' from** *client ip* **because of an error in the user.cfg file.**

Explanation: Authentication failed due to a user.cfg file specifications set by the Firewall administrator (check previous logs).

User Response: See your Firewall administrator.

ICA2132 **User '***user***' from ip** *client ip* **(client site) attempted the invalid command '***invalid command***' .**

Explanation: The user attempted an invalid command. The only valid commands at this point are SITE,USER, and QUIT.

ICA2133 **Error:** *function* **call failed in** *instance***:***line***,** *WSAGetLastError*

Explanation: General error message; check logs

ICA2134 **Notice: ftpd: connect() (in** *instance***) could not reach** *IP***,** *WSAGetLastError***.**

Explanation: Connect() could not find the requested address; check WSAGetLastError result.

User Response: double-check your address - may be DNS or network error

ICA2135 **Data transfer completed: Received** *bytes* **bytes (from** *source IP***); sent** *bytes* **bytes (to** *destination IP***).**

Explanation: This information reflects a single data transfer during a particular ftp session. However, note that it is possible that the data transfer may not have successfully completed (check log for a failed recv or send call).

ICA2136 **Error: CreateThread() failed in** *instance***:** *errno***.**

Explanation: ftpd could not create a thread

ICA2137 **Data connection established; server:** *source ip* **client:** *destination ip***.**

Explanation: Successful data connection.

ICA2138 **Insufficient memory: pftpd: malloc(***bytes***) returned NULL in function** *instance***.**

Explanation: Unable to allocate enough memory - malloc returned NULL.

ICA2139 **LogonUser() failed:** *reason***.**

Explanation: The Windows NT (SAM) API LogonUser (for password authentication) failed due to specified reason(s).

User Response: Contact the Firewall administrator.

ICA2140 **httpd --> HTTP Proxy authentication** *result* **for user <** *user***>, on <** *user ip***>, thru** *network* **... RC:<** *reason***>.**

Explanation: The HTTP Proxy attempted user authentication. It's success or failure is reported here for the specified reason.

User Response: Contact the Firewall administrator.

ICA2141 **FTP session to** *IP_address* **from** *IP_address* **terminates.**

Explanation: The ftp session to firewall terminates.

ICA2142 **fw_tn_authenticate authenticated** *userid* **successfully.**

Explanation: The indicated function successfully authenticated the indicated user id.

ICA2143 **fw_tn_authenticate authentication for** *userid* **failed.**

Explanation: fw_tn_authenticate cannot authenticate the specified user ID.

System Action: Login is refused.

User Response: If fw_tn_authenticate has any logging facilities, then the administrator should look at the log file to determine the cause.

ICA2144 **fw_tn_authenticate did not return successfully.**

Explanation: The value returned by fw_tn_authenticate is not zero. The function fw_tn_authenticate might be missing.

System Action: Login is refused.

User Response: Look at fw_tn_authenticate carefully to see if it ever returns a non-zero value and correct it if it occurs. If that is the case, make the library fwuser.o again and put it into the Firewall.

ICA2145 **The system returned return code** *rc* **in file** *filename* **at line** *linenumber***.**

Explanation: A system call failed. The library fwuser.o might be absent.

System Action: Authentication is aborted.

User Response: Make sure that /usr/lib/fwuser.o is

present. If it is, contact your IBM representative.

ICA2146 The IBM-supplied fwuser.o has not been replaced.

Explanation: You are using the IBM-supplied fwuser.o because you have not replaced it with your own fwuser.o.

System Action: Authentication is aborted.

User Response: You should write and compile your own authentication if you n defined any user to use User-Supplied authentication. The IBM-supplied n fwuser.o denies access to all non-AIX and non-Firewall users.

ICA2147 fwtelnet: user *user id* **started a transparent telnet session from** *source IP addr* **(secure side) to** *dest IP addr***.**

Explanation: Message generated at the start of each transparent proxy session (fwtelnet).A session begins when userid, source ip and destination ip are all known to the firewall. Only session started from secure side is allowed.

System Action: allow the transparent telnet.

ICA2148 Attention -- Unauthorized connection attempt for user *user id* **from** *source IP addr* **(nonsecure side) to** *dest IP addr***, is not allowed.**

Explanation: Generally indicates an attempt to establish a connection to Firewall across the non-secure interface.

System Action: Reject the connection.

User Response: You should telnet from secure side using transparent proxy.

ICA2149 fwtelnet: a LOGIN_ADAPTER_ERROR occured while starting a transparent telnet session from *source IP addr* **to** *dest IP addr***.**

Explanation: A LOGIN_ADAPTER_ERROR occured when calling q_check_secure(0).

System Action: Reject the connection.

User Response: check the secure adapter.

ICA2150 Pftpd error - *failing function***: return code = 0x***function return code*

Explanation: The pftpd server detected an error in the indicated function. The daemon terminates.

User Response: Correct the indicated system problem and restart pftpd.

ICA2151 Login refused.

Explanation: This message is to be displayed to user who tries to login but not allowed.

ICA2152 fwlogin: write to *device* **failed.**

Explanation: Cannot write to the device.

ICA2153 fwlogin: read from *device* **failed.**

Explanation: Cannot read to the device.

ICA2154 error in *portname* **with** *reason***.**

Explanation: This Firewall encountered a problem.

ICA2155 Pftpd error - *failing function***:** *system error message*

Explanation: The pftpd server detected an error in the indicated function. The daemon terminates.

User Response: Correct the indicated system problem and restart pftpd.

ICA2156 Attention -- User *user id* **tried to use transparent ftp from NONSECURE side** *source IP addr* **to** *dest IP addr* **, was not allowed.**

Explanation: Generally indicates an attempt to establish a connection to Firewall across the non-secure interface.

System Action: Reject the connection.

User Response: You should ftp from secure side using transparent proxy.

ICA2157 User *user id* **from** *source IP addr* **is not allowed to use transparent proxy to** *dest IP addr***.**

Explanation: Generally indicates an attempt to establish a connection to Firewall while transparent proxy is not configured.

System Action: Reject the connection.

User Response: turn fwtpproxy ftp = on

ICA2158 Option *value* **was specified incorrectly.**

Explanation: Indicated flag was specified incorrectly.

ICA2159 Timeout value not specified for -t option.

Explanation: A timeout value must be supplied for the -t option.

ICA2160 **Password changed for user** *user ID* **from** *network* **:***host name***.**

Explanation: An FTP user has successfully changed his password in the password database.

ICA2161 **User** *user ID* **attempted login using expired password from** *network* **:***host name***.**

Explanation: An FTP user attempted to establish a connection to the Firewall using an expired password.

System Action: The FTP login validation fails and the user is returned to the FTP command shell.

User Response: The user must attempt to validate again through the FTP USER command or by re-establishing the FTP connection and passing the password string of the form "old_password/new_password/new_password".

ICA2162 **Password change failure for user** *user ID* **from** *network* **:***host name***.**

Explanation: An FTP user attempted to change his password and the password validation routine failed. The possible reasons for the failure include: (1) Incorrect "old" password was specified, (2) Only one occurrence of the "new" password was specified, (3) Two occurrences of "new" password do not match, or (4) Delimiter used to separate passwords was not "/".

System Action: FTP password validation fails and the user is returned to the FTP command shell.

User Response: Attempt to re-validate with the FTP server verifying the passwords are being entered correctly. If the problem persists, contact the service representative.

ICA2163 **safemaild started.**

Explanation: Starting safemaild.

ICA2164 **safemaild stop.**

Explanation: stopping safemaild.

ICA2165 **Interrupted telnet session.**

Explanation: Telnet session is ending, but it cannot retrieve its session information from the pipe. The session was probably interrupted during startup by the client, thus the session was not fully initialized.

ICA2166 **Could not retrieve attribute** *attribute* **for user** *user id***. Return code =** *return code***.**

Explanation: The authentication service could not retrieve the specified attribute from the user database for the specified user. System Action : The user authentication fails.

User Response: Contact system administrator to correct the user's database record.

ICA2167 *user id* **authentication failed for** *service* **using** *authentication scheme* **from** *client address* **on** *network type*

Explanation: The specified user failed to be authenticated for the specifed service using the specified authentication method. The user was requesting the service from the indicated address and network type. System Action : The user authentication fails.

User Response: Contact system administrator.

ICA2168 *user id* **authentication failed for** *service* **due to storage shortage.**

Explanation: User ID could not be authenticated for service because there was a memory allocation failure during authentication processing. System Action : The user authentication fails.

User Response: Contact system administrator.

ICA2169 **User** *name* **successfully authenticated for** *service* **using** *method* **from** *network***:***host name***.**

Explanation: FW authenticated the indicated user name for the requested service using the specified authentication scheme.

ICA2170 *user id* **authentication failed for** *service***.** *auth method* **is not registered with the Firewall.**

Explanation: User ID could not be authenticated for service. The requested authentication method is not registerd with the Firewall. System Action : The user authentication fails.

User Response: Contact system administrator.

ICA2171 **Account** *user_name* **has been locked due to an expired password.**

Explanation: The password has expired and not been changed. This account has been locked.

System Action: The account is locked and Firewall password authentications will fail.

ICA2172 **Account** *user_name* **is locked.**

Explanation: This account has been locked.

System Action: The account is locked. Firewall password authentications will fail.

User Response: See your Firewall administrator for unlocking the account.

ICA2173 **User tried to login using reserved user name** *user id***.**

Explanation: The ID supplied by the user is reserved for use by the firewall.

System Action: Login is refused.

User Response: The administrator should investigate who is using this username.

ICA2174 *user id* **authentication failed for** *service* **using** *authentication scheme* **from** *client address* **on** *network type* **due to an internal processing error.**

Explanation: The specified user failed to be authenticated for the specifed service using the specified authentication method. The user was requesting the service from the indicated address and network type. The authentication request failed due to an internal processing processing error. System Action : The user authentication fails.

User Response: Contact system administrator.

ICA2175 **Windows NT LogonUser call failed for user** *user name***. Last error was** *last error***.**

Explanation: The specified user name failed to be authenticated by the Windows NT LogonUser API call. Windows NT reported last error after LogonUser failed. System Action : The user authentication fails.

User Response: Contact system administrator.

ICA2176 **Unknown authentication scheme** *authentication scheme* **was defined for** *user name* **using** *component* **from** *network***.**

Explanation: The specified authentication scheme was defined for the specified user when using the specified firewall component from the specified network but the authentication scheme is not currently registered with the firewall. System Action : The user authentication request fails.

User Response: Contact system administrator.

ICA2177 **SafeMail connection 0x***session ID* **received from** *socket peer name***.**

Explanation: SafeMail received an inbound connection from the peer name listed. The indicated connection ID number has been assigned for tracking purposes. (Debug level)

System Action: A thread has been dispatched to handle this connection.

ICA2178 **SafeMail session 0x***session ID* **has been established from** *sender's IP address* **to** *recipient's IP address***.**

Explanation: SafeMail has established contact with the recipient mail server and is ready to transfer mail. (Info level)

System Action: Data transfer is about to begin.

ICA2179 **SafeMail has forwarded** *message size* **bytes for connection 0x***session ID* **from** *sending server's address* **to** *receiving server's address***.**

Explanation: SafeMail has successfully forwarded a message between the two mail servers listed. This session was previously identified in an ICA2166 message. This message contained the number of bytes indicated. (Info level)

ICA2180 **SafeMail terminated session 0x***Session ID* **from** *sender's address***.**

Explanation: SafeMail has refused to transfer the mail being sent in the indicated session. (Info level)

System Action: The session has been terminated.

User Response: Increase the logging priority level to obtain more detailed diagnostic information.

ICA2181 **SafeMail terminated session 0x***Session ID* **for reason code** *reason code***.**

Explanation: SafeMail's main processor terminated the indicated session because a primary error condition was detected. Reason codes include: 01 - unable to locate the recipient mail server 02 - sender attempted to route mail between two nonsecure servers 03 - recipient mail server rejected the connection, may be down 04 - recipient mail server refused to accept the mail 05 - one or more connections timed out; either the sending or the receiving mail server may be down 06 - recv() returned 0 bytes; either the sending or the receiving mail server may be down 07 - recv() returned negative; either the sending or the receiving mail server may be down 08 - too many error commands were received 09 - select() return negative; either the sending or the receiving mail server may be down This message is logged at Debug level.

System Action: The connection has been terminated.

ICA2182 **SafeMail rejected session 0x***Session ID* **because of an invalid** *SMTP command* **command, reason code** *reason code***.**

Explanation: SafeMail's command-validation subroutine detected an invalid or a dangerous command. These reason codes vary for each SMTP command. See the IBM Firewall Support web page for current values. (Debug level)

System Action: The connection has been terminated.

User Response: Correct the sending mail client or the sending mail server so that safe and valid information is being sent.

ICA2183 **httpd --> HTTP Proxy Configuration file (*filename*) is not available.**

Explanation: The HTTP proxy daemon attempted to open the specified configuration file but it either does not exist or could not be opened.

System Action: HTTP Proxy does not start

User Response: Configure the proxy via the GUI or the fwhttp command and restart the proxy.

ICA2184 **signal() error with signal** *signal No.*. **safemaild exit.**

Explanation: System error when safemaild daemon attempted to establish signal handler.

ICA2185 **Cannot open socket. safemaild exit**

Explanation: Failure while opening the socket.

ICA2186 **Cannot bind the socket to the port. safemaild exit**

Explanation: SafeMail could not bind to the appropriate port. The port number specified in the services file may be out of range or not valid, or there may be another service already using same port.
SystemAction:SafeMail has ended.
UserResponse:Correct the services file, or reconfigure the other application to use a different port.

ICA2187 **Cannot accept new connection. safemaild try again**

Explanation: Failure while accepting new connection.

ICA2188 **Incorrect time (*value*) specified for -l.**

Explanation: The time value shown contains characters outside the numeric range of 0..9 or exceeds the maximum allowed value.

ICA2189 **Timeout value not specified for -l option.**

Explanation: A timeout value must be supplied for the -l option.

ICA2190 **SafeMail could not use the indicated cache file directory (*Cache file*). SafeMail has terminated.**

Explanation: Safemail needs some space on the indicated file system for storing temporary data. This directory must exist and it must be writeable by the ″nobody″ user. The default directory is /tmp.

System Action: Safemail has stopped.

User Response: The -f parameter should be used to select a different directory, or the new directory should be created, or the file system permissions should be corrected.

ICA2191 **The error occurred writing the SafeMail cache file for session** *Session ID*.

Explanation: Safemail needs some space on the indicated file system for storing temporary data.

System Action: In the event of a delivery problem, SafeMail would be unable to send a failure notification. Safemail will continue to attempt delivery,and successful deliveries will not be impeded.

User Response: Increase the amount of free space in the cache directory, or select a different location with more space available.

ICA2192 **Session** *Session ID* **from secure sender** *IP Address* **identified itself with a nonsecure domain name,** *Sender's domain*.

Explanation: The indicated session is receiving a note from a secure network address, but the sender's ID which was sent in the MAIL FROM command does not match any of the configured secure mail domains. This is often caused by misconfigured mail clients.

System Action: Message delivery will be attempted anyway, but in the event of a delivery failure, SafeMail will not be able to report that failure to the sender.

User Response: Reconfigure the sending client to send its private domain name.

ICA2193 **Session** *Session ID* **encountered an error attempting delivery to** *IP Address*.

Explanation: SafeMail was unable to deliver the message to the indicated mail server.

System Action: Delivery will continue to all other recipients. At the end of the transmission, the sender will be notified of all failures.

User Response: No further action is necessary.

ICA2194 **A mail routing loop has been detected from** *Sending server* **to** *Receiving server* **for** *domain name*.

Explanation: The specified mail exchanger for the indicated domain was either the same as the sender or same as one of the Firewall's interfaces.

System Action: SafeMail refused this recipient. Delivery will continue to any additional recipients.

User Response: Examine the mail routing architecture and implementation, including the mail-exchanger information stored in DNS, for possible loops.

ICA2200 **(***service***:***function***) WinSocket initialization error :** *WSAGetLastError*

Explanation: Error occured when initializing WinSocket.

User Response: Correct the system problem indicated by WSAGetLastError and restart the indicated service (First Parameter).

ICA2201 **(***service***:***calling function***)** *failed function* **failed at line** *line number* **:** *WSAGetLastError*

Explanation: The Networking component specified has failed

User Response: Correct the system problem indicated by WSAGetLastError and restart the indicated service (First Parameter).

ICA2202 **(***service***:***calling function***)** *timeout* **timed out after** *WSAGetLastError* **seconds :**

Explanation: The indicated function timed out after idling for the specified time.

User Response: Reconnected to the indicated service and respond before the indicated timeout

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ICA2203 **(***service***:***calling function***) Memory error;** *failed function* **returned** *return value* **at line** *line number***:** *WSAGetLastError*

Explanation: Memory error has occured, usually out of memory; check WSAGetLastError

User Response: Free up disk space - consult System Administrator

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ICA2204 **(***service***:***calling function***)** *filename* **error: access denied or creation failed.**

Explanation: The indicated service encountered an error when attempting to access or create the specified file or the file associated with the file parameter.

User Response: Make sure the indicated filename exists and has the correct permissions.

ICA2205 **(***service***:***calling function***) File** *filename* **is required but could not be found.**

Explanation: The file specified does not exist. The most likely reason for the failure is that the Firewall default configuration was erased. Restore the file from a current backup.

User Response: Verify that the configuration file does not exist. The configuration program expects this file to exist. If a backup version is not available contact your service representative.

ICA2206 **(***service***:***calling function***)** *filename* **is corrupted.**

Explanation: The indicated configuration file is not in a usable format. The contents have become corrupted. The most likely reason for the corruption is that the file was manually edited and invalid data added.

User Response: The configuration file will need to be recreated correctly. First cat the file (or make a viewable copy) then erase the original file. Reconfigure the file by using the appropriate firewall configuration command using the original file for reference, if necessary.

ICA2207 **(***service***:***calling function***)** *filename* **is empty.**

Explanation: The indicated configuration file was either not found or the file was found, but it is empty. The most likely reason for the file not being found is that the configuration for the indicated service has not been performed.

User Response: Verify the state of the configuration file. If the file exists, the configuration command expects this file to contain data. Consult the manual for additional information.

ICA2208 *service* **Session** *session id* **started for** *user id* **from a non-secure adapter (***source IP address***:***dest IP addr***).**

Explanation: Message generated at the begining of each indicated session.

ICA2209 *service* **Session** *session id* **ended for** *user id* **from a non-secure adapter (***source IP address***:***dest IP addr***); bytes** *total bytes***.**

Explanation: Message generated at the end of each indicated session. Total Bytes indicates the number of bytes transferred during the session. Services (i.e., ptelnetd) that do not support Total Bytes will indicate zero.

ICA2210 **(***service***) User** *user id* **attempted login using expired password from** *source IP address* **(non-secure).**

Explanation: The indicated user attempted to establish a connection to the Firewall using the indicated expired password from the indicated source IP on a non-secure adapter.

User Response: The password given has expired per password ruleset. Contact your system admin.

ICA2211 **(*service*) User *user id* attempted login using expired password from *source IP address* (secure).**

Explanation: The indicated user attempted to establish a connection to the Firewall using the indicated expired password from the indicated source IP on a secure adapter.

User Response: The password given has expired per password ruleset. Contact your system admin.

ICA2212 **(*service*) User *name* was successfully authenticated from *source IP address* (secure).**

Explanation: FW authenticated the indicated user name from the indicated source IP on a secure adapter.

ICA2213 **(*service*) User *name* was successfully authenticated from *source IP address* (non-secure).**

Explanation: FW authenticated the indicated user name from the indicated source IP on a non-secure adapter.

ICA2214 **(*service*) User *name* failed authentication from *source IP address* (non-secure).**

Explanation: FW failed authentication for the indicated user name from the indicated source IP on a non-secure adapter.

User Response: Most likely cause was incorrectly typed user name or password; User names and passwords are case sensitive (check Caps Lock).

ICA2215 **(*service*) User *name* failed authentication from *source IP address* (secure).**

Explanation: FW failed authentication for the indicated user name from the indicated source IP on a secure adapter.

User Response: Most likely cause was incorrectly typed user name or password; User names and passwords are case sensitive (check Caps Lock).

ICA2216 **(*service*) User *name* from *source IP address* (non-secure) did not enter matching (verification) passwords.**

Explanation: A password change was requested or required and the indicated user from the indicated source IP on a non-secure adapter entered passwords that did not match. The user authentication data was not changed.

User Response: Changing passwords requires typing the password twice, the second time for verification; Most likely cause was an incorrectly typed verification password.

ICA2217 **(*service*) User *name* from *source IP address* (secure) did not enter matching (verification) passwords.**

Explanation: A password change was requested or required and the indicated user from the indicated source IP on a secure adapter entered passwords that did not match. The user authentication data was not changed.

User Response: Changing passwords requires typing the password twice, the second time for verification; Most likely cause was an incorrectly typed verification password.

ICA2218 ***service* Session *session id* started for *user id* from a secure adapter (*source IP address*:*dest IP addr*).**

Explanation: Message generated at the begining of each indicated session.

ICA2219 ***service* Session *session id* ended for *user id* from a secure adapter (*source IP address*:*dest IP addr*); bytes *Total Bytes*.**

Explanation: Message generated at the end of each indicated session. Total Bytes indicates the number of bytes transferred during the session. Services (i.e., ptelnetd) that do not support Total Bytes will indicate zero.

ICA2220 **(*service*) User *user id* started a transparent proxy session from *source IP addr* (secure side) to *dest IP addr*.**

Explanation: Message generated at the start of each transparent proxy session. A session begins when userid, source ip and destination ip are all known to the firewall. Only session started from secure side is allowed.

System Action: allow the transparent proxy.

ICA2221 **(*service*) Warning: IP (*Control IP addr*) at peer end of Control line was not equal to IP (*Data IP addr*) at peer end of Data line.**

Explanation: For Security purposed (i.e., anti-hijacking) Make sure the IP Address of the the peer to which the Control Connection socket is connected is the same as the IP of the peer to which the Data Connection socket is connected. These may be different if using Net Dispatcher or if the destination has used multiple adapters

System Action: Check to see if the Destination FTP Server is using multiple adapters or Net Dispatcher is

being used. Make sure filters only allows valid IP addresses through port 20 and port 21.

ICA2222 **(*service*) Warning! Protocol violation. Received Non-RFC compliant command** *invalid string*; **Expected** *protocol string*.

Explanation: The indicated service received an unexpected string which is not compliant with the associated RFC; possible hacker.

System Action: Use a Client that complies with the RFC for the indicated service

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ICA2251 **hostname =** *Host Name*, **msg_id =** *Message ID*, **subject =** *Subject*, **input_mta =** *Input MTA*, **output_mta =** *Output MTA*, **msg_size =** *Message Size*, **orig_in =** *Originator (as we received it)*, **orig_out =** *Originator (as we transmitted it)*, **recip_in =** *Recipient (as we received it)*, **recip_out =** *Recipient (as we sent it)*, **sent =** *Sent Status*.

Explanation: The tracking records for all the connections attempted to estabilish.

ICA2252 **Could not set socket options %1$s**

Explanation: An attempt to configure the socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack and operating system security should be verified.

ICA2253 **Could not map socket to streams: %1$s**

Explanation: An attempt to map the descriptors for the socket to a stream has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack and operating system security should be verified.

ICA2254 **Could not open socket: %1$s**

Explanation: An attempt to open a socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack as to the availability and permissions for the socket specified in the configuration should be verified.

ICA2255 **Could not bind to socket: %1$s**

Explanation: An attempt to bind to a socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack as to the availability and permissions for the socket specified in the configuration should be verified.

ICA2256 **Could not listen to socket: %1$s**

Explanation: An attempt to listen to a socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack as to the availability and permissions for the socket specified in the configuration should be verified.

ICA2257 **Could not enable nonblocking mode for socket: %1$s**

Explanation: An attempt to enable nonblocking mode for a socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack as to the availability and permissions for the socket specified in the configuration should be verified.

ICA2258 **Serious I/O error getting the socket name: %1$s**

Explanation: An attempt to get name for a socket has been rejected by the operating system for the reason listed in the message. The configuration of the TCP/IP stack as to the availability and permissions for the socket specified in the configuration should be verified.

ICA2259 **Error reading from %1$s: %2$s**

Explanation: An attempt to read from a connection with the hostname listed has failed for the listed reason. This could occur for instance because the TCP/IP connection has been disrupted or an error occurred in the device or application that was connected.

ICA2260 **No parsable MX records found for %s**

Explanation: An attempt to use DNS to route a message to a hostname using DNS has resulted in no MX records. Check the DNS configuration for the hostname listed to correct the problem.

ICA2261 **Error writing temporary file: %s**

Explanation: While trying to write recovery information to a temporary file the operating system reported the listed error. Correct the problem in the operating system or environment.

ICA2262 **I/O error writing to temporary storage: %s**

Explanation: While trying to write recovery information to a temporary file the operating system reported the listed error. Correct the problem in the operating system or environment.

ICA2263 Error sending body part: %s

Explanation: While trying to send the body of a message in the data segment of the SMTP transfer the listed error occurred. This could be the result of a problem in the system to which the connection was made or in the TCP/IP stack for instance. If possible verify the proper operation of the receiving system.

ICA2264 I/O error sending body part: %s

Explanation: While trying to send the body of a message in the data segment of the SMTP transfer the listed error occurred. This could be the result of a problem in the system to which the connection was made or in the TCP/IP stack for instance. If possible verify the proper operation of the receiving system.

ICA2265 Failed to send fallback message: %s

Explanation: AThe attempt to send a message to the fallback system has failed and the message was not able to be delivered This could be the result of a problem in the system to which the connection was made or in the TCP/IP stack for instance. If possible verify the proper operation of the fallback system.

ICA2266 Conversation failure: %1$s : %2$s

Explanation: An I/O error has occurred in the module name listed with the error listed. This is most likely the result of a problem with the operating environment.

ICA2267 Cannot start a processing thread : will shutdown: %s

Explanation: An attempt to start a processing thread by the main processing task has failed and processing is being shutdown. Correct the problem with the operating environment and retry.

ICA2268 Fatal error: unable to wait on mother board semaphore, error code (%s)

Explanation: An attempt to wait on a sempahore by the main processing task has failed and processing is being shutdown. Correct the problem with the operating environment and retry.

ICA2269 Connection with the overflow host failed: %s

Explanation: The attempt to connect to the fallback system has failed with the listed error code. This could be the result of a problem in the system to which the connection was made or in the TCP/IP stack for instance. Verify the proper operation of the fallback system.

ICA2270 Overflow host refused fallback mail: %s

Explanation: The attempt to send a message to the fallback system has failed with the listed error code. Correct the configuration or operating environment for the fallback system.

ICA2271 Overflow MTA has failed.

Explanation: The attempt to send a message to the fallback system has failed. Correct the configuration or operating environment for the fallback system.

ICA2272 Overflow rejected recipient: %1$s for (%2$s)

Explanation: The attempt to send a message to the fallback system has failed. The actual address being used to deliver the message is listed as well as the preferred mail address. Correct the configuration or operating environment for the fallback system.

ICA2273 Could not open the overflow channel for %1$s(%2$s)

Explanation: The attempt to send a message to the fallback system has failed. The actual address being used to deliver the message is listed as well as the preferred mail address. Correct the configuration or operating environment for the fallback system.

ICA2274 Shutdown signal received

Explanation: A signal to shutdown has been received and processing will stop.

ICA2275 Listening for Connections.

Explanation: Initialization has completed successfully.

ICA2276 Received a connection from: %s

Explanation: A connection has been established by the system with the hostname listed.

ICA2277 Connection closed with: %s

Explanation: A connection has been closed with the system listed.

ICA2278 Monitor is Starting.

Explanation: The main processing task that monitors the operation of the processing threads has started.

ICA2279 **Monitor is Terminating.**

Explanation: The main processing task that monitors the operation of the processing threads is terminating and processing will cease.

ICA3001 ***Alert*: real user is** *ident user name*, **not** *socks connect user name*

Explanation: Possible security breach attempt, user name not authenticated.

ICA3006 *count* **bytes from** *client*, *count* **bytes from** *server*

Explanation: Message indicating number of bytes transferred between the sockd daemon and its respective client and server hosts.

ICA3007 **A connection was refused due to exceeding the maximum connection count.**

Explanation: The socks server is configured to only accept a certain maximum number of client sessions. This message is generated when that threshold has already been met and additional connection requests arrive.

System Action: The newly-attempted connection is closed.

User Response: The maximum number of concurrent connections is determined by the SOCKS5_MAXCHILD parameter in socks5.conf. Increase this setting and refresh the server. See the IBM Firewall reference for details. start unused

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ICA3010 **connected -- Bind from** *user*(*real_user*)@*src_addr* **for** *dst_addr* (*destination port*)

Explanation: Connection established.

ICA3011 **connected -- Connect from** *user*(*real_user*)@*src_addr* **to** *dst_addr* (*application*)

Explanation: Successful socket connection to outside world.

ICA3012 **refused -- Connect from** *user*(*real_user*)@*src_addr* **to** *dst_addr* (*application*)

Explanation: Remote host refused connection.

ICA3013 **select()** *errno*

Explanation: System error.

ICA3014 **terminated -- Bind from** *user*(*real_user*)@*src_addr* **for** *dst_addr* (*destination port*).(*count* **bytes from** *client*, *count* **bytes from** *server*)

Explanation: Connection terminated.

ICA3015 **terminated -- Connect from** *user*(*real_user*)@*src_addr* **to** *dst_addr* (*destination host*).(*count* **bytes from** *client*, *count* **bytes from** *server*)

Explanation: Connection to server terminated.

ICA3016 ***Cannot find appropriate interface to communicate with** *destination host*

Explanation: File /etc/sockd.route does not contain routing information for the specified destination host.

ICA3017 **Cannot execute shell command for pid** *sockd process*

Explanation: Sockd daemon unable to execute a /bin/sh command.

User Response: Verify the /bin/sh shell is available on the system.

ICA3018 **refused -- Bind from** *user*(*real_user*)@*src_addr* **for** *dst_addr*

Explanation: Remote host refused connection.

ICA3019 **Error in GetDst() from host** *socks_src_name*: *errno*

Explanation: Error in resolving destination address for requested connection.

ICA3022 **Invalid ?= field at line** *line number*

Explanation: Invalid entry found in /etc/sockd.conf file.

ICA3023 **Invalid comparison at line** *line number*

Explanation: Invalid entry found in /etc/sockd.conf file.

ICA3024 **Invalid entry at line** *line number*

Explanation: Invalid entry found in /etc/sockd.route file.

ICA3025 **Invalid permit/deny field at line** *line number*

Explanation: Invalid entry found in /etc/sockd.conf file.

ICA3026 **Invalid port number at line** *line number*

Explanation: Invalid entry found in /etc/sockd.conf file.

ICA3027 **Shell Command Failed (***exec status***) for <***cmd***>**

Explanation: Shell command displayed between < and > failed.

User Response: Verify shell processor is available on the system.

ICA3030 **Unable to open config file (***/etc/sockd.conf***)**

Explanation: Open request against indicated file failed.

ICA3031 **Unable to open routing file (***/etc/sockd.route***):** *errno*

Explanation: Open request against indicated file failed.

User Response: See your Firewall administrator. A default file was provided during Firewall installation.

ICA3032 **Unable to open userfile (***user name file***):** *errno*

Explanation: The filename specified for *=userlist on a permit rule could not be found.

ICA3033 **Unexpected result from Validate()**

Explanation: Identd verification of the user name was specified, Identd responded with unexpected result.

ICA3035 **Cannot connect to identd on** *client host*

Explanation: Identd verification of the user name was specified, Identd does not respond.

ICA3039 **Error -- shell command \"***cmd***\" contains no alphanumeric characters.**

Explanation: Invalid shell command, see log message.

ICA3040 **Error -- shell_cmd fork()** *errno*

Explanation: Sockd daemon unable to switch to child process via 'fork()'

ICA3041 **Error -- unable to get client address.**

Explanation: Error return from 'getpeername()' call.

User Response: Check routing and DNS configuration.

ICA3042 **Error -- undefined command (0x***hex-command-received***) from host** *client address*

Explanation: Invalid command received from client application.

User Response: Possible client configuration problem, or mismatch on client and Firewall support level.

ICA3043 **Error -- wrong version (0x***hex-version-number***) from host** *client address***.**

Explanation: Firewall supports socks version 4.2.

User Response: Possible client configuration problem, or mismatch on client and Firewall support level.

ICA3044 **Failed -- Connect from** *user***(***real_user***)@***src_addr* **to** *dst_addr* **(***application***). Error code:** *command causing failure errno***.**

Explanation: Connection request failed.

ICA3045 **Failed -- Bind from** *user***(***real_user***)@***src_addr* **for** *dst_addr***. Error: connected to wrong host** *dst_name* **(***dst_port (application)***).**

Explanation: Bind request failed.

ICA3046 **Failed -- Bind from** *user***(***real_user***)@***src_addr* **for** *dst_addr***. Error code:** *command causing failure errno***.**

Explanation: Bind request failed.

ICA3047 **Timed-out -- Bind from** *user***(***real_user***)@***src_addr* **for** *dst_addr*

Explanation: Connection timed out.

ICA3048 **Shell command too long:** *command***...**

Explanation: The command to be executed, from the /etc/sockd.conf file, is too long.

ICA3049 **Timed-out -- Connect from** *user***(***real_user***)@***src_addr* **to** *dst_addr* **(***application***)**

Explanation: Connection timed out.

ICA3050 *matched sockd.conf filter rule*

Explanation: Filter rule from the /etc/sockd.conf file which matched the socks connection.

ICA3051 **AIX sockd_route() cannot find interface for** *remote address***.**

Explanation: Could not find interface route information.

ICA3052 **Error setting userid to 'nobody'.**

Explanation: Could not set userid of the child sockd process to "nobody".

ICA3053 **Error on popen(AIX route script):** *system error message*

Explanation: Failure running script to find routing information.

ICA3054 **Fatal memory allocation failure in AIX sockd_route().**

Explanation: Memory allocation failure trying to gather routing information.

ICA3055 **Fatal error AIX sockd_route() parsing for first space in:** *input line*

Explanation: Error parsing system route information.

ICA3056 **Fatal error AIX sockd_route() parsing for second space in:** *input line*

Explanation: Error parsing system route information.

ICA3057 **Fatal error in AIX sockd_route() reading route script output:** *system error message*

Explanation: Error reading script output.

ICA3058 **Error on popen(AIX adapter script):** *system error message*

Explanation: Failure running script to find interface information.

ICA3101 **Sockd error sending data - select():** *system error message*

Explanation: (SOCKS422) Error while sending data.

ICA3102 **Sockd error sending data - write():** *system error message*

Explanation: (SOCKS422) Error while sending data.

ICA3103 **Sockd error receiving data - select():** *system error message*

Explanation: (SOCKS422) Error while receiving data.

ICA3104 **Sockd error receiving data - read():** *system error message*

Explanation: (SOCKS422) Error while receiving data.

ICA3105 **Cannot create process id file** *filename***.**

Explanation: (SOCKS422) Process id file creation/write failed.

ICA3106 **Sockd failed to fork child:** *system error message*

Explanation: (SOCKS422) Attempt to fork child to handle a SOCKS request failed.

ICA3107 **Set inbound socket SO_LINGER option failed:** *system error message*

Explanation: (SOCKS422) not critical

ICA3108 **Set outbound socket SO_LINGER option failed:** *system error message*

Explanation: (SOCKS422) not critical

ICA3109 **Invalid entry at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3110 **Illegal interface field at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3111 **Illegal destination IP at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3112 **Illegal destination mask at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3113 **Parsed** *number of lines* **lines in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3114 **No valid lines found in file** *filename***.**

Explanation: (SOCKS422) Configuration file empty, or incorrect syntax.

User Response: Correct the indicated configuration file.

ICA3115 **Invalid 'permit/deny' field at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3116 **Invalid '?=' field at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3117 **Illegal source IP at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3118 **Illegal source mask at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3119 **Invalid comparison at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3120 **Invalid port number at line** *line number* **in file** *filename***.**

Explanation: (SOCKS422) Incorrect configuration entry syntax.

ICA3121 **Received SIGUSR1 - dumping socks configuration.**

Explanation: (SOCKS422) Signal to dump active configuration to log file, following this message.

ICA3122 **Sockd could not fork daemon:** *system error message*

Explanation: (SOCKS422) Fork to initialize sockd daemon failed.

User Response: Correct the indicated system problem and restart sockd.

ICA3123 **Sockd server starting.**

Explanation: (SOCKS422) Sockd has successfully initialized and is awaiting connections.

ICA3124 **Fatal sockd initialization error - bind():** *system error message*

Explanation: (SOCKS422) Sockd server initialization failed, daemon terminated.

User Response: Correct the indicated system problem and restart sockd.

ICA3125 **Fatal sockd initialization error - listen():** *system error message*

Explanation: (SOCKS422) Sockd server initialization failed, daemon terminated.

User Response: Correct the indicated system problem and restart sockd.

ICA3126 **Fatal sockd error - main accept():** *system error message*

Explanation: (SOCKS422) Sockd server main routine failed, daemon terminated.

User Response: Correct the indicated system problem and restart sockd.

ICA3127 **Sockd server received terminate signal.**

Explanation: root or nobody killed the process, daemon terminated.

User Response: Restart sockd if the administrator so desires (type "sockd").

ICA3128 **Fatal sockd initialization error - socket():** *system error message*

Explanation: Sockd server initialization failed, daemon terminated.

User Response: Correct the indicated system problem and restart sockd.

ICA3129 **Fatal sockd initialization error -** *failing function***:** *system error message*

Explanation: Sockd server initialization failed in the indicated function, daemon terminated.

User Response: Correct the indicated system problem and restart sockd.

ICA3130 **Sockd error -** *failing function***:** *system error message*

Explanation: The sockd server detected an error in the indicated function. The daemon continues, but connections may be refused or terminated.

User Response: If the problem persists, stop sockd, correct the indicated system problem and restart sockd.

ICA3131 **Error reading** *file name***. Previously cached data will be used.**

Explanation: The file could not be read or contained incorrect data. A previous message should describe the problem. Sockd will continue to operate with cached data from the previous version of the file.

User Response: Correct the error in the indicated file.

ICA3132 **Unknown flag -***value***.**

Explanation: The indicated flag is not recognized, daemon terminated.

User Response: Correct the syntax and restart sockd.

ICA3133 **Unknown parameter** *value***.**

Explanation: The indicated parameter is not recognized, daemon terminated.

User Response: Correct the syntax and restart sockd.

ICA3134 **Conflicting options** *option1* **and** *option2***.**

Explanation: The indicated options cannot be specified together, daemon terminated.

User Response: Correct the syntax and restart sockd.

ICA3135 **Sockd error -** *failing function***: return code = 0x***function return code*

Explanation: The sockd server detected an error in the indicated function. The daemon terminates.

User Response: Correct the indicated system problem and restart sockd.

ICA3136 **Sockd error -** *failing function***:** *error message*

Explanation: The sockd server detected an error in the indicated function. The daemon terminates.

User Response: Correct the indicated system problem and restart sockd.

ICA3700 **WinSocket initialization error :** *WinSocket error*

Explanation: Error occured when initializing WinSocket.

User Response: Correct the indicated system problem and restart sockd.

ICA4000 *program* **- Warning: Received signal** *signal***, terminating ...**

Explanation: Termination due to receipt of signal.

ICA4001 **STOP** *program* **as PID** *processId*

Explanation: Prints end of daemon completion. Informational message.

ICA4002 **Temporary ID**

Explanation: Informational message.

ICA4003 **Problem with child process** *processId***.**

Explanation: Could not create a child process.

ICA4004 **Fatal Error. Killing fwpagerd on signal** *signal***.**

Explanation: Signal handler.

ICA4005 **No fwpagerd daemon running,** *program* **not found.**

Explanation: Could not send a page as daemon was not active.

ICA4006 **No fwpagerd daemon running with process id** *processId***.**

Explanation: Could not find the process Id of the daemon process.

ICA4007 **START** *program* **as PID** *processId*

Explanation: Print start information. Informational message.

ICA4008 Cannot set sigignore for SIGPIPE.

Explanation: Failure while setting up to ignore the broken pipe signal.

ICA4009 Cannot set sigset for SIGCHILD.

Explanation: Failure while setting up to catch a dying child signal.

ICA4010 Cannot set termination process.

Explanation: Failure while setting signal to catch termination process.

ICA4011 Cannot open socket.

Explanation: Failure while opening socket.

ICA4012 Cannot set sigset for SIGTERM.

Explanation: Failure while setting up to catch SIGTERM & SIGINT signals.

ICA4013 Cannot set socket reuse option.

Explanation: Failure while setting socket reuse option.

ICA4014 Cannot set socket linger option.

Explanation: Failure while setting socket linger option.

ICA4015 Cannot bind the socket to the port.

Explanation: Failure while binding the socket to the port.

ICA4016 Cannot set listen on socket.

Explanation: Failure while setting up to listen on socket.

ICA4017 Service *servName* **using TCP socket** *socket***.**

Explanation: Informational msg.

ICA4018 Function call select() failed.

Explanation: Internal function call failure.

ICA4019 Severe error from new_work().

Explanation: Internal severe error from new_work routine.

ICA4020 Error(*program***): Could not write to stream socket:** *socket*

Explanation: Possible system error.

User Response: Check socket usage.

ICA4021 Problem receiving response.

Explanation: Problem receiving response from modem.

User Response: Check modem connections and the initialization string.

ICA4022 Request successful.

Explanation: Informational message.

ICA4023 Request failed.

Explanation: Request to send page has failed.

ICA4024 Error(*program***): Priority out of range (***minpri* **-** *maxpri***).**

Explanation: Incorrect priority range.

User Response: Correct priority range. Valid values are from -1 through 5.

ICA4025 Error(*program***): Address must be in the form of ID@carrier when -n option is used.**

Explanation: Incorrect command usage syntax.

User Response: Correct command usage syntax.

ICA4026 Error(*program***): Unknown host** *hostname*

Explanation: Could not resolve hostname.

User Response: Check hostname.

ICA4027 Error(*program***): Could not open stream socket :** *errno*

Explanation: Could not create a new socket.

ICA4028 Error(*program***): Could not set socket options :** *errno*

Explanation: Could not set socket linger option.

ICA4029 Error(*program***): Could not connect to** *host* **:** *errno***.**

Explanation: Could not connect to the host.

User Response: Check serial port configuration and existence of device driver file.

ICA4030 **Error(***program***): Could not write to stream socket :** *errno***.**

Explanation: Could not write to the stream socket.

ICA4031 **Problem receiving response. Condition of message unknown.**

Explanation: Problem receiving response from modem.

ICA4032 **Message sent successfully to queue.**

Explanation: Informational message. Message has been sent to queue.

ICA4033 **Message failed. No message(s) sent.**

Explanation: Could not send the message onto the pager queue.

ICA4034 *date* **Failed (ID** *ID* **Pri** *priority* **Secs** *period* **Tries** *retryCount***) [***fromEntry***]** *personName***:** *message***.**

Explanation: Displays this message when the page is sent unsuccessfully.

ICA4035 **Cannot re-queue message** *mesg* **from** *program* **to** *person***.**

Explanation: Could not send into paging queue.

ICA4036 **SUCCEEDED (ID** *ID* **Pri** *priority* **Secs** *period* **Tries** *retryCount***) [***fromEntry***]** *personName***:** *message***.**

Explanation: Displays this message when the page is sent successfully.Informational message.

ICA4037 **DUMPED to** *dumpFile* **(ID** *ID* **Pri** *priority* **Secs** *period* **Tries** *retryCount***) [***fromEntry***]** *personName***:** *message***.**

Explanation: Pages that are not sent immediately are dumped to a file to be tried later.

ICA4038 **Cannot write to dump file** *dumpFile***.**

Explanation: Dump file cannot be written into.

User Response: Check file system permissions.

ICA4039 **IpcKey: 0x***IpcKey*

Explanation: Informational message.

ICA4040 **Retry time of** *retryTime* **minutes exceeded.**

Explanation: Failed to initialize modem after the specified minutes.

User Response: Check initialization string.

ICA4041 **Found alphanumeric message for numeric pager.**

Explanation: Numeric pagers cannot contain alphanumeric data.

User Response: Correct using smitty/SMIT menu.

ICA4042 **Person cannot receive pages.**

Explanation: Pager is probably not activated.

User Response: Check pager for activation.

ICA4043 **Carrier** *carrier* **does not exist.**

Explanation: Carrier specified does not exist.

User Response: Correct using smitty/SMIT menu.

ICA4044 **Carrier** *carrier* **does not have a DTMF phone number.**

Explanation: Carrier specified does not have the DTMF phone number.

User Response: Correct using smitty/SMIT menu.

ICA4045 **Pager number** *pagerNumber* **is too long for carrier's maximum of** *carrLen***.**

Explanation: Pager number is too long for carrier's maximum.

User Response: Use another shorter pager number less than that of the carrier's maximum.

ICA4046 **Pager number** *pagerNumber* **is too long for default length of** *defaultCarrLen***.**

Explanation: This message occurs when the default length is too less.

User Response: Correct using smitty/SMIT menu. Increase default length.

ICA4047 **Problem at line** *lineNumber* **of modem file** *ModemfilePathname***.**

Explanation: Modem definition file contains an invalid character.

User Response: Correct using smitty/SMIT menu.

ICA4048 **Cannot open modem on device /dev/***deviceName***.**

Explanation: Could not open modem on specified device.

User Response: Check or re-configure serial port. Check device.

ICA4049 **Modem open on /dev/***deviceName***.**

Explanation: Informational message. Modem has been successfully detected on the serial port.

ICA4050 **Cannot set modem characteristics.**

Explanation: Failed while trying to set modem characteristics.

User Response: Check modem initialization string.

ICA4051 **Cannot initialize modem after** *numInitTries* **retries.**

Explanation: Modem could not be initialized.

User Response: Check modem initialization string and serial port configuration.

ICA4052 **Cannot dial pager number** *pagerNumber*

Explanation: Pager number cannot be dialed.

User Response: Check pager number validity.

ICA4053 **Cannot hangup modem.**

Explanation: Cannot hangup modem.

User Response: Check modem initialization string and hangup command used.

ICA4054 **Cannot dial message** *message*

Explanation: Cannot dial message.

ICA4055 **Problem at line** *lineNumber* **in modem file** *filename***.**

Explanation: Invalid modem definition file.

User Response: Correct using smitty/SMIT menu.

ICA4056 **Cannot dial carrier** *carrier***'s DTMF number (***DTMFnumb***).**

Explanation: DTMF number may have been changed or is incorrect for this carrier.

User Response: Correct using smitty/SMIT menu.

ICA4057 **Cannot transmit block.**

Explanation: Failed while trying to transmit block.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4058 **No response to transmitted block.**

Explanation: Could not get a response from the carrier after transmitting block.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4059 **Cannot receive response to message delivery.**

Explanation: Could not get a response from the carrier after message delivery.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4060 **Cannot transmit pager id.**

Explanation: Cannot transmit pager id.

User Response: Check pager number and carrier parameters using smitty/SMIT menu.

ICA4061 **Cannot transmit end <CR> of automatic mode request.**

Explanation: Cannot transmit end <CR> of automatic mode request.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4062 **Cannot transmit automatic mode request.**

Explanation: Cannot transmit automatic mode request signal.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4063 **Failed to receive go-ahead from carrier** *carrier* **after** *numTries* **retries.**

Explanation: Carrier may be busy at this time.

User Response: Check carrier parameters using smitty/SMIT menu and try later.

ICA4064 **Communications error during prompt with carrier** *carrier***.**

Explanation: Communications error may occur for a number of reasons. Try again later.

User Response: Check carrier parameters using

smitty/SMIT menu and try later.

ICA4065 **Cannot receive response to logon.**

Explanation: Modem cannot receive response to logon.

User Response: Check modem initialization string and carrier parameters.

ICA4066 **Carrier** *carrier* **did not respond to logon attempt.**

Explanation: Carrier did not respond to logon attempt.

User Response: Check carrier parameters using smitty/SMIT menu and try later.

ICA4067 **Carrier** *carrier* **said** *receiveDataString***.**

Explanation: Carrier transmitted back some error message or busy message.

User Response: Check carrier parameters using smitty/SMIT menu and try later.

ICA4068 **Carrier** *carrier* **forced a disconnect during logon.**

Explanation: Carrier forced a disconnect during logon.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4069 **Dumping messages to carrier** *carrier* **caused by** *ConnectRetryMax* **retry loops.**

Explanation: If carrier is busy, the program dumps pages and tries later.

ICA4070 **Skipping messages to carrier** *carrier* **caused by** *maxTotalTries* **session connect tries.**

Explanation: Carrier cannot be contacted after a number of tries.

User Response: Check carrier parameters and try again later.

ICA4071 **Error(***program***): Cannot allocate memory for carrier retry:** *errno***.**

Explanation: Possible system or memory allocation errors.

ICA4072 **Error(***program***): Cannot add to carrier retry list:** *errno***.**

Explanation: Carrier possibly may not exist.

User Response: Check carrier validity and try again.

ICA4073 **Data connection to carrier** *carrier* **at** *phoneNumber* **failed after** *retryCount* **retries.**

Explanation: Data connection has failed.

User Response: Check modem connections and carrier paramters using smitty/SMIT menu.

ICA4074 **ID prompt from carrier** *carrier* **was not received after** *numTries* **retries.**

Explanation: Carrier failed to response with an ID or acknowledgement prompt.

User Response: Make sure carrier uses the TeleAlphanumeric Protocol.

ICA4075 **Communications error during logon with carrier** *carrier***.**

Explanation: Communications error could occur for a number of reasons.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4076 **Maximum logon attempts to carrier** *carrier* **exceeded.**

Explanation: Carrier has failed to respond within the specified attempts.

User Response: Check carrier parameters and try again later.

ICA4077 **Message go-ahead not received from carrier** *carrier***.**

Explanation: Carrier has failed to response with a go-ahead prompt.

User Response: Check carrier parameters and try again later.

ICA4078 **Cannot create blocks.**

Explanation: Carrier could not create blocks for transmission.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4079 **Carrier** *carrier* **did not respond to message delivery.**

Explanation: Carrier had trouble delivering the message.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4080 **Carrier** *carrier* **forced a disconnect during message delivery.**

Explanation: Carrier forced a disconnect during message delivery.

User Response: Check carrier parameters and modem initialization string.

ICA4081 **Carrier** *carrier* **rejected message or Pager ID.**

Explanation: Carrier rejected the pager message or pager id.

User Response: Check validity of pager id, activation of pager and carrier parameters.

ICA4082 **Communications error during message delivery to carrier** *carrier***.**

Explanation: Communications errors could occur for a number of reasons.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4083 **Failed to receive confirmation from carrier** *carrier* **after** *maxTries* **retries.**

Explanation: This message occurs if the carrier is busy or cannot establish a connection.

User Response: Check carrier parameters using smitty/SMIT menu and try again after a few minutes.

ICA4084 **Cannot transmit <EOT>.**

Explanation: Modem cannot transmit <EOT>.

User Response: Check modem connections and initialization string.

ICA4085 **Cannot receive response to <EOT>.**

Explanation: Modem cannot receive response to <EOT>.

User Response: Check modem connections and initialization string.

ICA4086 **Carrier** *carrier* **did not respond to <EOT>.**

Explanation: Carrier cannot respond to transmitted data.

User Response: Check carrier validity and modem connections.

ICA4087 **Carrier** *carrier* **responded with data unacceptable error because of contents.**

Explanation: Carrier cannot respond to transmitted data.

User Response: Check carrier parameters using smitty/SMIT menu.

ICA4088 **Cannot open defaults file** *defaultPathname***.**

Explanation: The modem defaults file may not exist or has incorrect permissions.

User Response: Check file for existence and permissions.

ICA4089 **Incomplete defaults file** *defaultPathname***.**

Explanation: The modem defaults file has missing data.

User Response: Correct using smitty/SMIT menu.

ICA4090 **Invalid outside line number in defaults file** *defaultPathname* **at line** *lineNumber***.**

Explanation: Carrier database file has an invalid outside line number.

User Response: Clean the carrier database file.

ICA4091 **Invalid baud rate value in defaults file** *defaultFile* **at line** *lineNumber***.**

Explanation: Carrier database file has an invalid baud rate.

User Response: Clean the carrier database file.

ICA4092 **Invalid data bit value in defaults file** *defaultFile* **at line** *lineNumber***.**

Explanation: Carrier database file has an invalid data bit value.

User Response: Clean the carrier database file.

ICA4093 **Invalid parity value in defaults file** *defaultFile* **at line** *lineNumber***.**

Explanation: Carrier database file has an invalid parity value.

User Response: Clean the carrier database file.

ICA4094 **Invalid stop bit value in defaults file** *defaultFile* **at line** *lineNumber***.**

Explanation: Carrier database file has an invalid stop bit value.

User Response: Clean the carrier database file.

ICA4095 **Unrecognized tag** *tag id* **in defaults file** *defaultFile* **on line** *lineNumber***.**

Explanation: Carrier database file has an invalid tag.

User Response: Clean the carrier database file.

ICA4096 **Incorrect number of parameters.**

Explanation: Informational message.

ICA4097 **Error(***program***): Cannot create carrier list. Memory problems.**

Explanation: Possible system or memory problems.

ICA4098 **Error(***program***): Errors in paging carrier file** *carrierFile***.**

Explanation: Carrier database file has some invalid data.

User Response: Check the carrier database file for invalid tags.

ICA4099 **Error(***program***): Cannot get IPC token** *errno***.**

ICA4100 **Error(***program***): Cannot create retry list. Possible memory problems.**

Explanation: Possible system error or memory problems.

ICA4101 **Error(***carrier***): Cannot create queue, page_q_err:** *pageQErr***.**

ICA4102 **Error(***program***): Cannot setup signal catch for SIGTERM/SIGINT:** *errno***.**

Explanation: Possible system error.

ICA4103 **Error(***program***): Cannot set modem characteristics for carrier** *carrier***.**

Explanation: Could not setup the modem.

User Response: Check serial port configuration and initialization string.

ICA4104 **Missing tag** *tag* **for carrier** *carrier***.**

Explanation: Missing modem information. A tag could be baud rate, outside line, etc..

User Response: Check modem configuration file for invalid characters.

ICA4105 **Carrier** *carrier* **must have at least one phone number listed.**

Explanation: Carrier must contain the phone number.

User Response: Add the phone number using smitty/SMIT menu.

ICA4106 **Cannot open file** *CarrierFileName***.**

Explanation: Carrier database file must exist.

User Response: If not already present, create one using smitty/SMIT menu.

ICA4107 **Line** *lineNumber* **too long.**

Explanation: Line in carrier database file is too long.

User Response: Check carrier database file for invalid line.

ICA4108 **Unknown tag at line** *lineNumber***.**

Explanation: Unknown tag exists in carrier database file.

User Response: Check carrier database file for invalid tag.

ICA4109 **Invalid sequence at line** *lineNumber***.**

Explanation: Invalid sequence exists in carrier database file.

User Response: Check carrier database file for invalid sequence.

ICA4110 **Carrier** *carrier* **is not valid and is being skipped.**

Explanation: Carrier cannot be used for paging purposes.

User Response: Check validity of carrier.

ICA4111 **Cannot add carrier to list.**

Explanation: Carrier cannot be added to list.

User Response: Check carrier validity and phone numbers.

ICA4112 **Carrier name is missing or too long on line** *lineNumber***.**

Explanation: Carrier name is missing.

User Response: Add carrier using smitty/SMIT menu.

ICA4113 **Cannot allocate new paging carrier:** *carrier***.**

Explanation: Carrier cannot be allocated to list.

User Response: Check carrier validity and phone numbers.

ICA4114 **Value on line** *lineNumber* **is too long.**

Explanation: Encountered a line that is too long in carrier database file.

User Response: Cleanup the long line in carrier database file.

ICA4115 **Duplicate tag** *tag* **on line** *lineNumber* **ignored.**

Explanation: Encountered a duplicate tag.

User Response: Remove the duplicate tag from carrier database file.

ICA4116 **Value on line** *lineNumber* **does not exist.**

Explanation: Encountered a blank field.

User Response: Use smitty/SMIT to add a value in blank field.

ICA4117 **Value must be either Y, Yes, N or No on line** *lineNumber***.**

Explanation: This field requires either a Y, Yes, N or No.

User Response: Use smitty/SMIT to add or change valid data.

ICA4118 **Value must be greater than 0 on line** *lineNumber***.**

Explanation: This field must be positive.

User Response: Change value using smitty/SMIT to a positive value.

ICA4119 **Invalid value on line** *lineNumber***.**

Explanation: Encountered an invalid value on specified line.

User Response: Change value using smitty/SMIT menu.

ICA4120 **Carrier** *name* **is not valid and is being skipped.**

Explanation: Encountered an invalid carrier.

User Response: Add a valid carrier using smitty/SMIT menu.

ICA4121 **Cannot add carrier to list.**

Explanation: Cannot add carrier to the paging list.

User Response: Check carrier validity.

ICA4122 **Duplicate tag** *tag* **on line** *lineNumber* **ignored.**

Explanation: Encountered a duplicate tag in a carrier stanza.

User Response: Cleanup the carrier stanza containing duplicate values.

ICA4123 **Error(***program***): Could not get IPC token:** *errNo*

Explanation: Program could not get IPC token.

ICA4124 **Error(***program***): Error** *pageqErr* **while reading queue.**

Explanation: Program could not read queue.

ICA4125 *count* **Queue entries.**

Explanation: Informational message.

ICA4126 **Message with ID** *id* **deleted.**

Explanation: Informational message.

ICA4127 **ID** *id* **not in queue.**

Explanation: Informational message.

ICA4128 **Error(***program***): Error** *pageqErr* **while attempting to delete ID** *id***.**

Explanation: Tried to deleted an ID of the queue.

ICA4129 **Key is:** *entryKey* **content is @** *ptr***:** *ptr***.**

Explanation: Informational message only.

ICA4130 **Modem Characteristics:**

Explanation: Modem initialization information.

ICA4131 **Name:** *modemName*

Explanation: Modem initialization information.

ICA4132 **Init:** *initString*

Explanation: Modem initialization information.

ICA4133 **Command mode:** *command*

Explanation: Modem initialization information.

ICA4134 **Command terminator: 0x***terminator*

Explanation: Modem initialization information.

ICA4135 **Dial:** *dial*

Explanation: Modem initialization information.

ICA4136 **Dial pause:** *pause*

Explanation: Modem initialization information.

ICA4137 **Dial #:** *diallb*

Explanation: Modem initialization information.

ICA4138 **Dial *:** *dialstar*

Explanation: Modem initialization information.

ICA4139 **Hangup:** *hangup*

Explanation: Modem initialization information.

ICA4140 **Valid command response:** *validCommandresp*

Explanation: Modem initialization information.

ICA4141 **Valid connect:** *validConnect*

Explanation: Modem initialization information.

ICA4142 **Echo:** *echo*

Explanation: Modem initialization information.

ICA4143 **Modem debug record: PUTS(***id***) txd->** *outStr*

Explanation: Modem handshaking information.

ICA4144 **Modem debug record: PUTC(***id***) txd->** *outStr*

Explanation: Modem handshaking information.

ICA4145 **Modem debug record: GET rxd->** *record id*

Explanation: Modem handshaking information.

ICA4146 **Modem debug record: INPUT(***record id*

Explanation: Modem handshaking information.

ICA4147 **Modem debug record:) rxd->**

Explanation: Modem handshaking information.

ICA4148 **Modem debug record: WAITFOR(***record id*

Explanation: Modem handshaking information.

ICA4149 **Could not unblock child signal.**

Explanation: Unblocks the SIGCHLD signal.

ICA4150 **Could not block the child signal.**

Explanation: Blocks the SIGCHLD signal.

ICA4151 **Warm start file** *filePathname* **does not exist.**

Explanation: Informational message.

ICA4152 **Cannot open warm start file** *filePathname*

Explanation: Informational message.

ICA4153 **Line is too long in warm start file** *filePathname***.**

Explanation: The warm start file contains some invalid characters.

ICA4154 **Warm start file** *filePathname* **has data that is not being used.**

Explanation: Informational message.

ICA4155 **Warm start file** *filePathname* **is empty.**

Explanation: Informational message.

ICA4156 **Line** *lineNumber* **of warm start file** *filePathname* **has bad addressee** *address***, ignored.**

Explanation: Warm start file has some invalid characters. Informational message.

ICA4157 **Line** *lineNumber* **of warm start file** *filePathname* **has bad format, ignored.**

Explanation: Warm start file has some invalid characters. Informational message.

ICA4158 **Line** *lineNumber* **of warm start file** *filePathname* **has no message, ignored.**

Explanation: Warm start file has no messages. Informational message.

ICA4159 **Error queueing line** *lineNumber* **of warm start file** *filePathname***, ignored.**

Explanation: Warm start file has some invalid characters. Informational message.

ICA4160 **Warm start of** *count* **messages from file** *filePathname* **complete.**

Explanation: Informational message.

ICA4161 **Error(***program***): Too many consecutive child errors.**

Explanation: Too many child errors in a row. This occurs if either the carrier or the modem definition file has some invalid characters.

User Response: Check carrier database file and modem definition file using smitty/SMIT menu.

ICA4162 **Child cannot exec** *program* **:** *errno***.**

Explanation: Possible system error.

ICA4163 **Error(***errno***): Child cannot fork child :** *program name***.**

Explanation: Possible system error.

ICA4164 **Could not create paging carrier list.**

Explanation: Internal program error.

ICA4165 **Errors in paging carrier file** *carrierFile*

Explanation: Carrier database contains some invalid data.

User Response: Check carrier database file using smitty/SMIT menu.

ICA4166 **Informational message. IPC key is: 0x***IpcKey***.**

Explanation: Informational message.

ICA4167 **Could not create queue, page_q_err:** *pageQerr***.**

Explanation: Failed while trying to create queue.

ICA4168 **Paging Warm Start file created at** *time*

Explanation: Informational message.

ICA4169 **priority -p** *priority numPager* **from** *objfrom message*

Explanation: Informational message.

ICA4170 **priority -p** *priority alpaPager@carrier* **from** *from message*

Explanation: Informational message.

ICA4171 **priority -p** *priority* **-n** *numPager@carrier* **from** *from message*

Explanation: Informational message.

ICA4172 **End of pager warm start file.**

Explanation: Informational message. Denotes end of message.

ICA4173 **Cannot write into warm start file** *warmstrtFile***.**

Explanation: Warm start file may not exist.

ICA4174 *time* **STATUS-REQUEST from** *user@host*

Explanation: Displays the status request information.

ICA4175 *time* **SUMMARY-REQUEST from** *user@host***.**

Explanation: Displays the summary request information.

ICA4176 *count* **queue entries.**

Explanation: Counts the number of queue entries in pager queue.

ICA4177 **Oldest entry: ID** *id* **received at** *time***.**

Explanation: Displays the oldest entry in queue.

ICA4178 **Re-attaching memory after expansion failed.**

Explanation: Possible system error.

ICA4179 **Re-attaching memory after expansion failed to align.**

Explanation: Possible system error.

ICA4180 **Could not down PAGE_Q semaphore in page_q_print() :** *errno*.

Explanation: Possible system error.

ICA4181 **Could not up PAGE_Q semaphore in page_q_print() :** *errno*.

Explanation: Possible system error.

ICA4182 **link** *headLink* **-> message ID:** *id*.

Explanation: Informational message.

ICA4183 **Priority:** *priority*.

Explanation: Informational message.

ICA4184 **Person:** *name*.

Explanation: Informational message.

ICA4185 **Carrier:** *carrier*.

Explanation: Informational message.

ICA4186 **Mesg:** *message*.

Explanation: Informational message.

ICA4187 **Could not get shared RAM :** *errno*.

Explanation: Possible system error.

ICA4188 **Could not get attached shared RAM :** *errno*.

Explanation: Possible system error.

ICA4189 **Could not get PAGE_Q semaphore.**

Explanation: Possible system error.

ICA4190 **Could not initialize PAGE_Q semaphore in page_q_create() :** *errno*.

Explanation: Possible system error.

ICA4191 **Could not set PAGE_Q semaphore in page_q_create() :** *errno*.

Explanation: Possible system error.

ICA4192 **Could not down PAGE_Q semaphore in page_q_empty() :** *errno*.

Explanation: Possible system error.

ICA4193 **Could not up PAGE_Q semaphore in page_q_empty() :** *errno*.

Explanation: Possible system error.

ICA4194 **Could not down PAGE_Q semaphore in page_q_enq(***name***,***message***) :** *errno*.

Explanation: Possible system error.

ICA4195 **Could not up PAGE_Q semaphore in page_q_enq() :** *errno*.

Explanation: Possible system error.

ICA4196 **page_q_enq(): ID(***id***) Pri(***priority***) Person(***name***) Mesg(***message***).**

Explanation: Informational message.

ICA4197 **Could not down PAGE_Q semaphore in page_q_head() :** *errno*.

Explanation: Possible system error.

ICA4198 **Could not up PAGE_Q semaphore in page_q_head() :** *errno*.

Explanation: Possible system error.

ICA4199 **Could not down PAGE_Q semaphore in page_q_first() :** *errno*.

Explanation: Possible system error.

ICA4200 **Could not up PAGE_Q semaphore in page_q_first() :** *errno*.

Explanation: Possible system error.

ICA4201 **Could not down PAGE_Q semaphore in page_q_next() :** *errno*.

Explanation: Possible system error.

ICA4202 **Could not up PAGE_Q semaphore in page_q_next() :** *errno*.

Explanation: Possible system error.

ICA4203 **Could not down PAGE_Q semaphore in page_q_tail() :** *errno*.

Explanation: Possible system error.

ICA4204 **Could not up PAGE_Q semaphore in page_q_tail() :** *errno*.

Explanation: Possible system error.

ICA4205 **Could not down PAGE_Q semaphore in page_q_del() :** *errno*.

Explanation: Possible system error.

ICA4206 **Could not up PAGE_Q semaphore in page_q_del() :** *errno*.

Explanation: Possible system error.

ICA4207 **page_q_del(***ID***).**

Explanation: Debug information.

ICA4208 **Could not down PAGE_Q semaphore in page_q_deq() :** *errno*.

Explanation: Possible system error.

ICA4209 **Could not up PAGE_Q semaphore in page_q_deq() :** *errno*.

Explanation: Possible system error.

ICA4210 **page_q_del(): ID(***id***) Pri(***priority***) Person(***name***) Mesg(***message***).**

Explanation: Informational message.

ICA4211 **Could not down PAGE_Q semaphore in page_q_walk() :** *errno*.

Explanation: Possible system error.

ICA4212 **Could not up PAGE_Q semaphore in page_q_walk() :** *errno*.

Explanation: Possible system error.

ICA4213 **PAGE_Q is full.**

Explanation: The paging queue is full.

User Response: Send the page after some time.

ICA4300 **Hanging up.**

Explanation: Hanging up the call.

ICA4301 **Initializing modem ..**

Explanation: Initializing modem with the init string.

ICA4302 **Dialing .....**

Explanation: Dialing the phone number.

ICA4303 **Waiting for connection.**

Explanation: Waiting for the modem connection

ICA4304 **CONNECTED** *speed*

Explanation: Connecting at the indicated speed (baud rate)

ICA4305 **CONNECTED!!!!!!!**

Explanation: Connected to the pager service provider

ICA4306 **Requesting prompt for Automatic Mode.**

Explanation: Requesting prompt for automatic mode. Waiting for ″ID=″

ICA4307 **Prompt OK.....**

Explanation: Got ″ID=″ back from the provider.

ICA4308 **Sending Automatic Mode Request.**

Explanation: Sending ID and SST over to the pager service provider

ICA4309 **Send Automatic Mode Request .....OK!**

Explanation: Got [p back, meaning that the carrier received the AMR.

ICA4310 **Sending out message**

Explanation: Sending out message block over

ICA4311 **Waiting for result**

Explanation: Waiting for the confirmation

ICA4312 **Ack received. Page successful**

Explanation: The Ack control character was received from the carrier, indicating that the page was sent successfully.

ICA4313 **Nak received, Resend block. Attempt** *NakTries*

Explanation: Nak received. Pager provider is asking for resend

ICA4314 **Transaction error. Resend block. Attempt** *RsTries*

Explanation: Transaction error. Resending the block over.

ICA4315 **Carrier Terminate Connection.**

Explanation: Pager provider terminated the conversation. Call provider to resolve the problem if it persists.

ICA4350 **fwpage [carrier="..."] [modem="..."] [ID="..."] [msg="..."]**

Explanation: fwpage usage. Check your parameters and try again

ICA4351 *This* **file not exist**

Explanation: Check the file to see if it is under the right directory. The files carriers.cfg, modems.cfg, and pager.cfg must be created before using this code.

ICA4352 *What* **file corrupted**

Explanation: File has been modified by user and not in the stanza format. All attributes should be entered through GUI.

ICA4353 *What* **too long, please shorten it and try again**

Explanation: The 'What' parameter is too long. Shorten it and try again.

ICA4354 *What* **wrong.**

Explanation: If baud rate wrong, the valid options are: 600, 1200, 2400, 4800, 9600, 14400. If data bits per byte wrong, the valid options are: 7, 8. If stop bits wrong, the valid options are: 1,2. If out line prefix wrong, the inputs should only be numbers. If paging method wrong, only TAP is supported in this version. If pager ID error, check to see if it is all numbers. If parity wrong, the valid options are: O(odd), E(even), N(none), S(space), M(mark). If COM port wrong, the valid options are: COM1, COM2 .... COM port should be less than 10 in this versin. If message character wrong, check the message to see if there is special character in it.

ICA4355 **Set Parameters in** *where* **error.**

Explanation: Unable to set parameters in |where|. Check parameters and try again.

ICA4356 **when** *When*, **COM port reading error.**

Explanation: COM port reading error. Set modem echo on and try again

ICA4357 **when** *Where*, **COM port writing error.**

Explanation: COM port write error.

ICA4358 **Set** *What* **error**

Explanation: Pager code is reporting the error indicated by 'What'. Check the log file to pin down the error.

ICA4359 **Max tries exceed in** *Where*. **Abort program .....**

Explanation: Tried to open com port 60 times in 60 minutes. All failed. If this is the case, check the hardware connection. Or, tried to send pager message 10 times in 10 minutes. All failed. If this is the case, the page provider might be down.

ICA4360 **Unknown character in Carrier phone number:** **pCarrierPhoneNum*

Explanation: an unrecognized character found in the carrier phone number. Please check the number and try again.

ICA4361 **Warning!!! Paging provider's modem normally should be less than 2400.**

Explanation: This is just a warning. Paging provider's modem speed is normally set less than 2400.

ICA4362 **Unable to initialize modem**

Explanation: Change modem initialization string and try again.

ICA4363 **Modem returned Error.**

Explanation: Modem communication error

ICA4364 *tries* **try on open Com port error. Retry in 1 minute**

Explanation: Open com port error. Probably another program is using it. Automatically retry in 1 minutes

ICA4365 **Send page failed on** *tries* **try. Retry in 1 minutes**

Explanation: Send page failed. Check log file to find out the exact reason.

ICA4366 **Message too long, truncated**

Explanation: Just a warning. Message length is too long. Truncate to fit in.

ICA4367 **Reset Max message length to the internal defined value:***msg-length*

Explanation: Reset the max message length to the default value, because user defined message length is larger than the internal defined, which is 80.

ICA4368 **Action:** *Where* **error**

Explanation: If opening COM port error, check configuration and try again. If close COM handle error, system problem. If purge COM error, system problem. If send dial command error, dialing command problem. Check to see if it is a Hayes compatible modem. If send ID request error, check if the pager provider supports TAP protocol and phone number is correct for TAP service. If send automatic prompt error, check if the pager service works correctly. If send message error, check the log file to pin down the cause of failure. If prompt error, unable to get a prompt back from the pager provider.

ICA4369 **Too many transaction error. aborting ....**

Explanation: Too many transaction errors, abort this try.

ICA4370 **Too many Nak received, aborting the program .....**

Explanation: Too many Nak received from the page provider, abort this try.

ICA4371 *szComPort* **on COM port with function** *FunctionName* **return** *Error Number*

Explanation: check the parameters and try again.

ICA4372 **Modem return error message.....** *ReturnMessage*

Explanation: Messages are: Not connected. Ringing, but not connected. No carrier. No dial tone. Busy. No answer.

ICA4373 **(***function name***) Unknown response code from modem or carrier:** *char1***,** *char2***.**

Explanation: This message reports a response from the modem or carrier, that the Firewall's paging feature does not recognize. char1 and char2 are the ascii (hex) codes for the 1st 2 characters in the response.

User Response: Use this information when consulting your modem instructions or your carrier to determine the meaning of the unknown response.

ICA5005 **SKIT initialization failed. Return code is:** *return code*

Explanation: Secure socket initialization failed, return code from SKIT dispalyed.

ICA5014 **Remote Client Tunnel Server listening port** *server port #*

Explanation: Port number configured for sslrctd is displayed.

ICA5015 **Accepted connection from** *chp0.chp1.chp2.chp3*

Explanation: Client's IP address is displayed.

ICA5017 **Unable to get secure socket. Function skit_secure_soc_init retcode is:***function retcode*

Explanation: Cannot get secure socket because skit_secure_soc_init() failed.

ICA5018 **The slave server cipher specs used are** *spec1 spec2 spec3*

Explanation: Cihper specifications are displayed.

ICA5019 **Cannot get Free Homenet IP pool.**

Explanation: Dynamic filters problem.

ICA5020 **Cannot open remote client config file.**

Explanation: File /etc/security/rcsfile.cfg is unavailable.

User Response: Check file presence and it's contents.

ICA5021 **Cannot find '***keyword***' keyword.**

Explanation: File /etc/security/rcsfile.cfg doesn't have this keyword.

User Response: Check and correct /etc/security/rcsfile.cfg.

ICA5024 **Function skit_secure_soc_write() error in** *routine name***.**

Explanation: skit_secure_soc_write() failed in this routine.

ICA5025 **Function skit_secure_soc_write() error in ACKClient().**

Explanation: skit_secure_soc_write() failed in ACKClient() routine.

ICA5026 **Invalid return code received from Client in** *routine name***.**

Explanation: Unexpected return code received from client in this routine.

ICA5027 **Received return code for wrong request from Client in** *routine name***.**

Explanation: Request code in return code message is unexpected in this routine.

ICA5028 **Invalid Login Request.**

Explanation: Format of login request message is invalid.

ICA5030 **Unknown Remote Client ID :** *remote client ID*

Explanation: This user ID is unknown for firewall machine.

User Response: Correct user's information for this remote client.

ICA5031 **Function skit_secure_soc_write error in RCTLoginPhase.**

Explanation: skit_secure_soc_write() failed for login phase.

ICA5035 **Invalid Logout Request.**

Explanation: Format of logout request message is invalid.

ICA5067 **Invalid packet received.**

Explanation: Received packet format is invalid.

ICA5078 **Get unrecognized request in SvrReqHandler()**

Explanation: Unrecognized request received and will be ignored.

ICA5082 **Tunnel to client** *remote client ID* **has been disconnected.**

Explanation: Tunnel for the remote client with this ID was disconnected.

ICA5086 **ID:** *userid* **not defined.**

Explanation: This user ID does not exist on firewall machine.

ICA5087 **Authentication failed for '***userid***'.**

Explanation: Authentication failed for this user ID.

ICA5089 **Function rcFilterClear() failed. Return code is** *return code***.**

Explanation: rcFilterClear() failed with this return code.

User Response: Check IPSEC LAN client presence. These products can't coexist.

ICA5090 **Function rcFilterInit() failed. Return code is** *return code*

Explanation: rcFilterInit() failed with this return code.

ICA5091 **Function TunnelUp() cannot run executable file** *command line***.**

Explanation: Displayed command line failed system() call.

ICA5092 **Cannot get keyring password from recoverstash function call.**

Explanation: Cannot recover keyring password from the stash file.

ICA6000 **Tunnel** *tunnel id* **was successfully activated at:** *time***.**

Explanation: The tunnel was successfully activated at the given time.

ICA6001 **Tunnel** *tunnel id* **was successfully deactivated at:** *time***.**

Explanation: The tunnel was successfully deactivated at the given time.

ICA8001 **SYSLOG/udp: unknown service**

Explanation: Processing terminated because the syslog service was unknown or unavailable.

User Response: Contact the system programmer. SystemProgrammer :Check the /etc/services or tcpip.ETC.SERVICES data sets for the existence of syslog.

ICA8002 *function_name* **function failed -** *errno***, errno2 = 0x***errno2*

Explanation: Processing terminates because syslogd could not perform the specified function. The errno information is appended to the error message.

User Response: Contact the system programmer. SystemProgrammer :Use the errno information to determine the cause of the failure.

ICA8004 **Error detected on AF_INET socket, \ slogd will no longer monitor socket**

Explanation: This message is generated in addition to a select message.

User Response: None. SystemProgrammer :None.

ICA8006 **Unknown priority name** *"priority"*

Explanation: A priority name found in the configuration file is not valid.

User Response: Contact the system programmer. SystemProgrammer :Check the configuration file.

ICA8007 **Unknown facility name** *"facility"*

Explanation: A facility name found in the configuration file is not valid.

User Response: Contact the system programmer. SystemProgrammer :Check the configuration file.

ICA8008 **Message from SYSLOG@***hostname* **at** *timestamp* **...**

Explanation: The syslog daemon configuration file contained an entry to send syslog messages to all logged on users. This message will be sent to all users who are currently logged on to the system where the syslog daemon is running.

ICA8009 **SYSLOGD exiting on signal** *signal*

Explanation: The syslog daemon received a signal that has caused the syslog daemon to exit.

ICA8010 **SYSLOGD restarted**

Explanation: The syslog daemon has been restarted.

ICA8012 **SYSLOGD unable to record to SMF -** *error_text*

Explanation: An error occurred while writing a record to SMF. The error text information is appended to the error message.

User Response: Contact the system programmer. SystemProgrammer :Use the error text information to determine the cause of the SMF write failure.

ICA8013 **Update process status failed, return code = 0x***return_code*

Explanation: An error occurred while attempting to update the status of the syslogd process for the Firewall kernel process. The return code outlines the specific error that was returned from the update process status call.

User Response: Contact the system programmer. SystemProgrammer :Contact the service representative.

ICA8014 **Unknown option (-***startup_option***) specified on SYSLOGD invocation**

Explanation: An error occurred while attempting to start the syslogd daemon process. The option specified is not supported on the invocation of syslogd.

User Response: Check the startup options and restart the syslogd daemon. SystemProgrammer :If the problem persists, contact the service representative.

ICA8015 **Configuration file entry (***config_data***) is not valid**

Explanation: An error occurred while attempting to parse a configuration entry from the SYSLOG configuration file.

User Response: Check the configuration file entries and restart the syslogd daemon. SystemProgrammer :If the problem persists, contact the service representative.

ICA8016 *function_name* **failed for** *filename* **-** *errno*

Explanation: An error occurred while attempting to perform the specified function for the specified device. The errno information is appended to the error message.

User Response: Verify that the specified device exists and retry the request. If the problem persists, contact the system programmer. SystemProgrammer :If the problem persists, contact the service representative.

ICA8017 *function_name* **function failed -** *error text*

Explanation: Processing terminates because syslogd could not perform the specified function. The error text is appended to the error message.

User Response: Contact the system programmer. SystemProgrammer :Use the error text to determine the cause of the failure.

ICA8050 *function* **failed.** *error_text*

Explanation: An error was encountered executing the function displayed in the message. Additional information about the error is given by the error text.

User Response: Correct the error specified in the message and, if necessary, retry the operation.

ICA8051 *function* **failed: return code = 0x***return_code*

Explanation: An error was encountered executing the function displayed in the message. The return code from the specified function is also displayed.

User Response: Correct the error specified in the

message and, if necessary, retry the operation.

ICA8052 **FWSTACKD activating filter logging for** *stack_name***.**

Explanation: FWSTACKD is attempting to activate packet filter logging.

System Action: The program continues.

ICA8053 **FWSTACKD cannot activate filter logging for** *stack_name***.** *error_text*

Explanation: Activation of packet filter logging failed for the reason described in the accompanying error message.

System Action: Filter logging will not be performed.

User Response: Use the error message to correct the error, then reactivate filters logging with **fwfilter cmd=startlog**.

ICA8054 **FWSTACKD activating NAT logging for** *stack_name***.**

Explanation: FWSTACKD is attempting to activate network address translation (NAT) logging.

System Action: The program continues.

ICA8055 **FWSTACKD cannot activate NAT logging for** *stack_name***.** *error_text*

Explanation: Activation of network address translation (NAT) logging failed for the reason described in the accompanying error message.

System Action: Network address translation logging will not be performed.

User Response: Use the error message to correct the error, then reactivate network address translation logging with **fwnat cmd=startlog**.

ICA8056 **FWSTACKD activating NAT for** *stack_name***.**

Explanation: FWSTACKD is attempting to activate network address translation (NAT).

System Action: The program continues.

ICA8057 **FWSTACKD cannot activate NAT for** *stack_name***.** *error_text*

Explanation: Activation of network address translation (NAT) failed for the reason described in the accompanying error message.

System Action: Network address translation will not be performed.

User Response: Use the error message to correct the error, then reactivate network address translation with **fwnat cmd=update**.

ICA8058 **FWSTACKD reactivating tunnel definitions for** *stack_name***.**

Explanation: FWSTACKD is attempting to reactivate tunnel definitions that were active when the system was stopped.

System Action: The program continues.

ICA8059 **FWSTACKD cannot reactivate tunnel definitions for** *stack_name***.** *error_text*

Explanation: Activation of tunnel definitions failed for the reason described in the accompanying error message.

System Action: Tunnels definitions are not activated.

User Response: Use the error message to correct the error, then reactivate tunnel definitions with **fwtunnl cmd=activate**.

ICA8060 **FWSTACKD activating filter and Socks rules for** *stack_name***.**

Explanation: FWSTACKD is attempting to activate the current set of packet filter rules and Socks rules.

System Action: The program continues.

ICA8061 **FWSTACKD cannot activate filter and Socks rules for** *stack_name***.** *error_text*

Explanation: Activation of filter rules and Socks rules failed for the reason described in the accompanying error message.

System Action: Default filter rules will be in effect. Local access will be permitted, and all other access will be denied.

User Response: Use the error message to correct the error, then reactivate filters and Socks rules with **fwfilter cmd=update**.

ICA8062 **FWSTACKD activating RealAudio support for** *stack_name***.**

Explanation: FWSTACKD is attempting to activate RealAudio support.

System Action: The program continues.

ICA8063 **FWSTACKD cannot activate RealAudio support for** *stack_name***.** *error_text*

Explanation: Activation of RealAudio support failed for the reason described in the accompanying error message.

System Action: RealAudio services are unavailable.

User Response: Use the error message to identify the error, then fix the error and activate RealAudio with **fwaudio cmd=change**.

ICA8064 *function* **failed.** *error_text*

Explanation: An error was encountered executing the function displayed in the message. Additional information about the error is given by the error text.

User Response: Correct the error specified in the message and, if necessary, retry the operation.

ICA9000 **IBM Firewall evaluation expires in** *number of* **days.**

Explanation: This software is branded as an evaluation copy and will disable itself as indicated.

ICA9001 **File System Integrity Checker Warning -** *warning description text*

Explanation: fwfschk found a discrepancy in the filesystem - potential threat

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ICA9003 **Authentication failed for user** *name* **on the configuration server.**

Explanation: FW configuration server is unable to authenticate the indicated user.

User Response: See your FW administrator.

ICA9004 **User** *name* **successfully authenticated on the configuration server.**

Explanation: FW configuration server authenticated the indicated user.

ICA9005 **Starting remote configuration server.**

Explanation: Configuration server has been started.

ICA9006 **Ending remote configuration server.**

Explanation: Configuration server is ending.

ICA9007 **Remote configuration server unable to open message catalog.**

Explanation: One or more message catalogs used by the remote configuration server may be missing.

User Response: See your FW administrator.

ICA9008 **Remote configuration server failed on getpeername(): error** *errno***.**

Explanation: Configuration server is unable to obtain information about the client.

User Response: See your FW administrator.

ICA9009 **Remote configuration server failed on getsockname(): error** *errno***.**

Explanation: Configuration server is unable to obtain information about itself.

User Response: See your FW administrator.

ICA9010 **Remote configuration server failed obtaining adapter information.**

Explanation: Configuration server is unable to obtain adapter information.

User Response: See your FW administrator.

ICA9011 **Configuration server not enabled for remote configuration.**

Explanation: Configuration server has local=yes set in its configuration file and the client is on a remote machine.

User Response: See your FW administrator.

ICA9012 **Remote configuration server unable to read logon request.**

Explanation: Configuration server cannot read in the client logon request.

User Response: See your FW administrator.

ICA9013 **Remote configuration server received incorrect logon request.**

Explanation: Logon request contained incorrect information.

User Response: See your FW administrator.

ICA9014 **Remote configuration server unable to create pipe.**

Explanation: Configuration server cannot create a pipe for authentication.

User Response: See your FW administrator.

ICA9015 **Remote configuration server unable to create process.**

Explanation: Configuration server cannot create a process for authentication.

User Response: See your FW administrator.

ICA9016 **Starting EFM daemon.**

Explanation: The EFM daemon has been started on the managed firewall.

ICA9017 **Ending EFM daemon; rc =** *value***.**

Explanation: The EFM daemon is ending with the specified return code.

ICA9018 **EFM daemon unable to open message catalog.**

Explanation: One or more message catalogs used by the EFM daemon may be missing.

User Response: See your FW administrator.

ICA9020 **Unable to switch the running user ID.**

Explanation: failed to make the system call to switch the running user ID.

User Response: See your FW administrator.

ICA9021 **This firewall does not support** *logon* **mode.**

Explanation: This firewall does not support this particular mode.

User Response: See your FW administrator.

ICA9022 *user* **is not authorized to logon to the firewall in** *logon* **mode.**

Explanation: This username is not authorized to logon using this particular mode.

User Response: See your FW administrator.

ICA9023 **Unable to load EFM DLL.**

Explanation: failed to load the efm dll.

User Response: See your FW administrator.

ICA9024 **Transfer request started by** *user* **to firewall** *machine***.**

Explanation: The transfer operation has started.

ICA9025 **Transfer request ended with return code** *return code***.**

Explanation: The transfer operation has completed.

ICA9026 **Transfer request received from** *user* **on firewall** *machine* **on** *time***.**

Explanation: The transfer operation has started at the specified time.

ICA9027 **File** *filename* **in function** *function* **added to transfer request.**

Explanation: The file specified is going to be transferred.

ICA9028 **Activate request started by** *user* **to firewall** *machine***.**

Explanation: The activate operation has started.

ICA9029 **Activate request ended with return code** *return code***.**

Explanation: The activate operation has completed.

ICA9030 **Activate request received from** *user* **on firewall** *machine* **on** *time***.**

Explanation: The activate operation has started at the specified time.

ICA9031 **Activate of function** *function* **ended with return code** *return code***.**

Explanation: Activation of the specified function has completed.

ICA9032 **NAT configuration updated at** *time* **on** *date***.**

Explanation: NAT configuration has been updated.

ICA9033 **NAT support (level** *version.release***) initialized at** *time* **on** *date***.**

Explanation: Firewall NAT support has been initialized.

ICA9034 **NAT support deactivated at** *time* **on** *date***.**

Explanation: NAT support has been disabled.

ICA9035 **NAT unable to allocate Registered Address for Secured Address** *Secured IP Address***.**

Explanation: Secured Address not translated because there are no available addresses in the Registered Address pool.

ICA9036 **NAT released Registered Address** *Registered IP Address* **to address pool.**

Explanation: Registered Address has been released to registered IP address pool.

ICA9037 **Firewall interfaces being updated automatically on** *time_and_date***.**

Explanation: The Firewall initialization program has called **UpdateInterfaces()** to trigger the automatic update of the Firewall interfaces file, fwadpt.cfg.

ICA9038 **Interface** *address* **has been removed from Firewall configurations.**

Explanation: The dotted-decimal address listed had been listed in the Firewall config file fwadpt.cfg, but was not known to the TCP stack, and has therefore been removed from the config file.

ICA9039 **Interface** *address* **has been added to the Firewall configuration.**

Explanation: The dotted-decimal address listed was found by the TCP stack but had not been found in the Firewall config file fwadpt.cfg, and has therefore been added to the config file.

ICA9040 **Interface** *address* **mask was updated from** *oldmask* **to** *newmask***.**

Explanation: The mask in the fwadpt.cfg file did not match what was found installed on the hardware. The correct mask field was updated in the fwadpt.cfg file.

ICA9041 **No interfaces were found on this machine.**

Explanation: No adapter interfaces were found on this machine.

ICA9042 **NAT activated with a working many-to-one address** *many-to-one address***.**

Explanation: NAT has successfully initialized and now is active. If the address is 0, this implies that many-to-one translation is inactive.

ICA9043 **NAT failed to initialize with returned code** *rc***.**

Explanation: NAT failed to initialize and is inactive.

System Action: No NAT function will be invoked.

User Response: If user wants NAT functionality, look at the returned code and make adjustment to correct it. If problem persists, contact IBM service.

ICA9044 **NAT deactivated.**

Explanation: NAT has successfully deactivated and is now inactive.

ICA9045 **NAT allocated address:port** *address***:***port* **for secured address:port** *secured address***:***port*

Explanation: NAT has allocated the address:port from the address pool on behalf of the secured host.

ICA9046 **NAT is unable to allocate many-to-one address for secured address** *secured address*

Explanation: NAT has run out of ports with the many-to-one address.

System Action: The local host's packet has been dropped.

User Response: This implies that there are too many outstanding connections. An administrator might want to decrease the time-out associated with the many-to-one address in an attempt to eliminate idle translation table entries more quickly.

ICA9047 **NAT deallocated address:port** *address***:***port* **from secured address:port** *secured address***:***port***.**

Explanation: NAT returned the specified address:port pair to the available pool.

ICA9048 **NAT detected a fragmented packet with protocol:***protocol* **address:port** *address***:***port* **secured address:port** *secured address***:***port***.**

Explanation: NAT has detected either a fragment FTP control packet or a fragmented ICMP error error message. NAT will translate a fragmented FTP control packet, however the payload is not examined. If this was a fragmented PORT command, the FTP data will fail because the IP address contained in the message is not translated. If the packet is a fragmented ICMP error message, it will be dropped.

System Action: See explanation.

User Response: If this happens repeatedly, notify IBM service.

ICA9049 **NAT detected an out of order fragment from** *source address* **to** *destination address* **that could not be translated.**

Explanation: NAT has detected a fragmented datagram that has arrived prior to the first fragment of the dategram.

System Action: NAT cannot translate the fragment correctly and the datagram is dropped.

User Response: If this happens repeatedly, notify IBM service.

ICA9050 **NAT failed to translate a packet with protocol:***protocol***, source address:port** *address***:***port***, destination address:port** *secured address***:***port***, with returned code** *rc***.**

Explanation: NAT failed to translate a packet.

System Action: packet is dropped.

User Response: If ICA9050e is issued, some severe event is happening or has happened on the Firewall host that is causing NAT to fail and the packet to be dropped. That severe event could be, for example: 1) A normal or abnormal shutdown of the Firewall host has occurred. 2) The Kernel is currently severely short of memory. 3) An internal NAT processing error has occurred. There is no recommended user response to error log message ICA9050e other than to contact IBM service and report the problem if knowledge of the state of the Firewall host and any possible severe events it has undergone doesn't already explain it. Supplying the return code will help IBM service pinpoint the nature of the severe event and where in the NAT code the severe event was detected. The ICA9050e error log message is issued to make the user aware that packets are being dropped by the Firewall.

ICA9051 **NAT detected a packet arrived with protocol:***protocol* **to address:port** *address***:***port* **from secured address:port** *secured address***:***port*

Explanation: NAT has detected the arrival of a packet.

ICA9052 **NAT detected a packet leaving with protocol:***protocol* **to address:port** *address***:***port* **from secured address:port** *secured address***:***port*

Explanation: NAT has detected the departure of a packet.

ICA9053 *stringValue filename* **in %3$d**

Explanation: debugging

System Action: none

User Response: none

ICA9054 **IP address:***address* **cannot be used as a many-to-one address and a nonsecure/secure interface address simultaneously.**

Explanation: They cannot be identical.

System Action: The requested action is not performed.

User Response: Choose a different nonsecure/secure address or different many-to-one address.

ICA9055 **NAT detected an out of order fragment from** *source address* **to** *destination address* **that could be translated.**

Explanation: NAT has detected an internal or final datagram fragment that has arrived out of order.

System Action: NAT was able to translate the fragment correctly and so did not drop the datagram.

User Response: none

ICA9056 **NAT could not translate a packet, protocol ICMP (type** *type***, code** *code***), source address** *source address***, destination address** *destination address***.**

Explanation: Unlike NAT error log message ICA9050e, this NAT informational log message indicates NAT's inability to translate a packet due to a current NAT functional limitation. Although NAT cannot perform the translation, NAT's configuration data indicates these packets should not pass through the Firewall without NAT translation. Rather than risk a security exposure by allowing untranslated packets to flow through to the non-secure network, NAT drops the packet. This log message is informational because it does not indicate an error has occurred.

System Action: The packet is dropped.

User Response: none

ICA9060 **Fatal configuration server initialization error - socket():** *system error message*

Explanation: Configuration server initialization failed, daemon ended.

User Response: Correct the specified system problem and start the configuration server again.

ICA9061 **Fatal configuration server initialization error - listen():** *system error message*

Explanation: Configuration server initialization failed, daemon ended.

User Response: Correct the specified system problem and start the configuration server again.

ICA9062 **Fatal configuration server error - main accept():** *system error message*

Explanation: Configuration server main routine failed, daemon ended.

User Response: Correct the specified system problem and start the configuration server again.

ICA9063 **Configuration server error -** *failing function*: **return code = 0x***function return code*

Explanation: The configuration server detected an error in the specified function. The daemon ends.

User Response: Correct the specified system problem and start the configuration server again.

ICA9064 **Unknown option -***value* **ignored.**

Explanation: Specified option is not recognized.

ICA9065 **Configuration server error -** *failing function*: *system error message*

Explanation: The configuration server detected an error in the specified function. The daemon ends.

User Response: Correct the specified system problem and start the configuration server again.

ICA9066 **Insufficient memory: configuration server: malloc(***bytes***) returned NULL in function** *function_name***.**

Explanation: Unable to allocate enough memory - malloc returned NULL.

ICA9067 **Bind failed, address:** *port* **already in use.**

Explanation: Port address given is currently being used.

System Action: The configuration server ends.

User Response: Connect to the Configuration Server using a different port address, or contact your Firewall administrator.

ICA9068 **-***value* **option failed or was specified incorrectly.**

Explanation: The indicated option failed or was specified incorrectly.

System Action: The configuration server ends.

User Response: Correct the usage of the specified option and start the configuration server again.

ICA9069 **SSL Initialization failed.**

Explanation: The SSL encryption environment was unable to be initialized or the handshake with the partner failed.

System Action: The configuration server ends.

User Response: See your Firewall administrator to verify the SSL environment.

Appendix B. Hardening for the AIX System Configuration

Hardening is a process that maximizes security and efficiency by turning off unnecessary daemons and disabling unauthorized user IDs. Hardening is part of installation of the IBM Firewall software and edits the system resources that might compromise security.

The hardening process:

- Removes these daemons from /etc/rc.tcpip: lpd, routed, gated, portmap, timed, snmpd, rwhod, fs, sendmail, named and dpid2.
- Disables the AIX Common Desktop Environment.
- Removes all unnecessary programs from inittab. Everything is taken out of /etc/inittab EXCEPT init, brc, powerfail, rc, fbcheck, srcmstr, rctcpip, cron, cons, logsymp, diagd, acfgd, pmd and tty.
- Disables all logins for users except root, daemon, bin, adm, nobody, and any previous IBM Firewall users.
- Sets owners to root for all files and directories that have no owners, and sets permissions to zero.
- During the hardening process, root is converted to a firewall user with remote logins disabled. Also, any previous firewall users using a downlevel version are migrated to the new version.
- Disables nonsecure applications by setting permissions to zero. These nonsecure applications are: tftp, utftp, tftpd, uucpd, rcp, rlogin, rlogind, rsh, and rshd.
- Disables everything in /etc/inetd.conf EXCEPT: ftp, telnet, and ibmfwrcs (remote config server daemon).

When the hardening process is complete, the file system integrity checker database is generated.

Appendix C. SNMP Management Information Base (MIB)

This appendix gives detail of the Firewall MIB.

```
-- FW fwMib Definitions
--
IBMFW-fwMib DEFINITIONS ::= BEGIN

-- This component represents a system configured with IBM's
-- Internet Connection IBM Firewall (FW) product.
-- The groups defined are as follows:

-- the FW Syslog Trap group
-- the FW Server Status Trap group
-- the FW Component ID group
-- the FW Software Component Information group
-- the FW Subagent group
-- the FW Server Table group
-- the ftpd Proxy Server Group
-- the telnetd Proxy Server Group
-- the Mail Server Table Group
-- the Log File Management Table group
-- the FW Server Status Table group
-- the FW Server Concurrency Status Table group
-- the FW Configuration File Table group
-- the FW Filter Status group
-- the Network Configuration group
-- the Threshold Configuration Table group
-- the Active IP Tunnel Table group
-- the Network Address Translation Table


IMPORTS
     Counter, enterprises
             FROM RFC1155-SMI
     OBJECT-TYPE
             FROM RFC-1212
     DisplayString
             FROM RFC1213-fwMib
     TRAP-TYPE
             FROM RFC-1215;
--
-- The MIB was registered under the original name Secured Network Gateway
-- (SNG).
--

internet            OBJECT IDENTIFIER ::= { iso org(3) dod(6) 1 }
private             OBJECT IDENTIFIER ::= { internet 4}
enterprises         OBJECT IDENTIFIER ::= { private 1 }
ibm                 OBJECT IDENTIFIER ::= { enterprises 2 }
ibmProd             OBJECT IDENTIFIER ::= { ibm  6 }
ibmSNG              OBJECT IDENTIFIER ::= { ibmProd 129 }
fwMib                OBJECT IDENTIFIER ::= { ibmSNG 1 }
fwSubagent          OBJECT IDENTIFIER ::= { ibmSNG 2 }


-- FW Syslog Trap Group ======================================
```

```
    fwSyslogTrapGrp OBJECT IDENTIFIER ::= {fwMib 1}

    fwSyslogFacility OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "syslog facility that generated the record."
         --               The string can be one of the following:
         --                     "local1"
         --                     "local4"
        ::= {fwSyslogTrapGrp 1}

    fwSyslogLogFileName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "File where the syslog record was entered."
        ::= {fwSyslogTrapGrp 2}

    fwSyslogDate OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Date of the syslog record."
        ::= {fwSyslogTrapGrp 3}

    fwSyslogTime OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Time of the syslog record."
        ::= {fwSyslogTrapGrp 4}

    fwSyslogHost OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Host in the syslog record."
        ::= {fwSyslogTrapGrp 5}

    fwSyslogPid OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Process id in the syslog record."
        ::= {fwSyslogTrapGrp 6}

    fwSyslogMsgText OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Message text in the syslog record."
        ::= {fwSyslogTrapGrp 7}


-- FW Server Status Trap Group ==================================
    fwSvrStatTrapGrp OBJECT IDENTIFIER ::= {fwMib 2}

    fwSvrName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
```

```
        STATUS            mandatory
        DESCRIPTION       "The server's name."
        ::= {fwSvrStatTrapGrp 1}

    fwSvrProgram OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "The server executable name"
        ::= {fwSvrStatTrapGrp 2}

    fwSvrState OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "The server's current running state."
         --               The string can be one of the following:
         --                     "running"
         --                     "not running"
        ::= {fwSvrStatTrapGrp 3}

    fwSvrStateValue OBJECT-TYPE
        SYNTAX            INTEGER
        {
            vUnknown      (0),
            vNotRunning   (1),
            vRunning      (2)
        }
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION      "The server's current running state (integer form)."
        ::= {fwSvrStatTrapGrp 4}

   fwSvrTrapTimestamp OBJECT-TYPE
       SYNTAX            DisplayString (SIZE (0..30))
       ACCESS            not-accessible
       STATUS            mandatory
       DESCRIPTION       "Timestamp at which the server status trap generated."
       ::= {fwSvrStatTrapGrp 5}

    fwSvrTrapHost OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "Hostname from where the trap generated."
        ::= {fwSvrStatTrapGrp 6}


-- FW Component ID Group ====================================
   fwComponentIdGroup OBJECT IDENTIFIER ::= {fwMib 3}

   fwManufacturer OBJECT-TYPE
       SYNTAX            DisplayString (SIZE (0..32))
       ACCESS            read-only
       STATUS            mandatory
       DESCRIPTION       "The company that produced this component."
        --               The string is: "IBM Corporation".
       ::= {fwComponentIdGroup 1}

   fwProduct OBJECT-TYPE
       SYNTAX            DisplayString (SIZE (0..255))
```

```
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of this component or product."
         --               The string is: "IBM FW SNMP Subagent."
        ::= {fwComponentIdGroup 2}

    fwVersion OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..16))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The version string for this component."
        ::= {fwComponentIdGroup 3}

    fwVerify OBJECT-TYPE
        SYNTAX            INTEGER
     -- {
          -- vAnErrorOccurred;CheckStatusCode       (0),
          -- vThisComponentDoesNotExist             (1),
          -- vTheVerifyIsNotSupported               (2),
          -- vReserved                              (3),
          -- vComponent'sFunctionalityUntested      (4),
          -- vComponent'sFunctionalityUnknown       (5),
          -- vComponentIsNotFunctioningCorrectly    (6),
          -- vComponentFunctionsCorrectly           (7)
     -- }
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "A code that provides a level of verification
                          that the component is still installed and
                          working.  This value is 2 for this release."
        ::= {fwComponentIdGroup 4}

    fwVerifyString OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..32))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "A string that corresponds to the aVerify
                          value.  The string for this release will
                          be:  Verify is not supported."
        ::= {fwComponentIdGroup 5}

-- FW Software Component Information Group ========================
    fwSoftwareCompInfoGroup OBJECT IDENTIFIER ::= {fwMib 4}

    fwMajorVersion OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..16))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Major version of this fwSoftware component."
              ::= {fwSoftwareCompInfoGroup 1}

    fwMinorVersion OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..16))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Minor version of this fwSoftware component."
             ::= {fwSoftwareCompInfoGroup 2}

    fwRevision OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..16))
        ACCESS            read-only
```

```
        STATUS            mandatory
        DESCRIPTION       "Revision of this fwSoftware component."
               ::= {fwSoftwareCompInfoGroup 3}

    fwTargetOperatingSystem OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The operating system for which this fwSoftware
                          component is intended."
               ::= {fwSoftwareCompInfoGroup 4}

    fwLanguageEdition OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..16))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The language edition of this fwSoftware
                          component.  This string will be : English."
        ::= {fwSoftwareCompInfoGroup 5}

    fwTargetOsString OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..32))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The operating system for which this fwSoftware
                          component is intended.  This is AIX for this release."
        ::= {fwSoftwareCompInfoGroup 6}

-- FW Subagent Group ========================================
    fwSubagentGroup OBJECT IDENTIFIER ::= {fwMib 5}

    fwSubagtName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..32))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of this subagent is IBM FW
                          Subagent.  The string is: IBM FW Subagent."
        ::= {fwSubagentGroup 1}

    fwSubagtUpTime OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..26))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The date and time the FW subagent was last
                          started."
        ::= {fwSubagentGroup 2}

    fwCritlogPoll OBJECT-TYPE
         SYNTAX            INTEGER
         ACCESS            read-write
         STATUS            mandatory
         DESCRIPTION       "Polling interval (in minutes) for critlog thread."
         ::= {fwSubagentGroup 3}

    fwCritlogTimestamp OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..26))
        ACCESS            read-write
        STATUS            mandatory
        DESCRIPTION       "Beginning timestamp for monitoring critlog records."
        ::= {fwSubagentGroup 4}
```

```
   fwCritlogLocation OBJECT-TYPE
       SYNTAX            DisplayString (SIZE (0..255))
       ACCESS            read-write
       STATUS            mandatory
       DESCRIPTION       "Location of critlog file(s)."
       ::= {fwSubagentGroup 5}

   fwSvrStatPoll OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-write
        STATUS            mandatory
        DESCRIPTION       "Polling interval (in minutes) for server status thread."
        ::= {fwSubagentGroup 6}

-- FW Server Table Group ========================================
-- FwSvrEntry has to start with an upper case otherwise mosy gives an error

    fwSvrTbl OBJECT-TYPE
        SYNTAX            SEQUENCE OF FwSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "A list of entries for FW servers configured on this
 host."::= {fwMib 6}

    aFwSvrEntry OBJECT-TYPE
        SYNTAX            FwSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwServerName}
        ::= {fwSvrTbl 1}

    FwSvrEntry ::= SEQUENCE
    {        fwServerName            DisplayString,
        fwServerSocketType      DisplayString,
        fwServerProtocol        DisplayString,
        fwServerWait            DisplayString,
        fwServerUser            DisplayString,
        fwServerProgram         DisplayString,
        fwServerArgs            DisplayString }

    fwServerName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW or inet server."
         --               The string can be one of the following:
         --                     "Unknown"
         --                     "FTPD Proxy"
         --                     "Telnetd Proxy"
         --                     "Http Proxy"
         --               ... or any service in the file /etc/services.
        ::= {aFwSvrEntry 1}

    fwServerSocketType OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The type of socket the server is using."
         --               The string can be one of the following:
         --                     "stream"
```

```
             --                    "dgram"
             --                    "sunrpc_udp"
             --                    "sunrpc_tcp"
            ::= {aFwSvrEntry 2}

        fwServerProtocol OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION       "The communication protocol the server is using."
             --               The string can be one of the protocols found in the
             --               file /etc/protocols.
            ::= {aFwSvrEntry 3}

        fwServerWait OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION      "The wait/no wait attribute of the server."
             --               The string can be one of the following:
             --                     "wait"
             --                     "nowait"
            ::= {aFwSvrEntry 4}

        fwServerUser OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION       "The username inetd uses to start the server."
            ::= {aFwSvrEntry 5}

        fwServerProgram OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..255))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION       "Full pathname of the server that inetd should execute."
            ::= {aFwSvrEntry 6}

        fwServerArgs OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION       "Command line arguments used in starting the server."
            ::= {aFwSvrEntry 7}


    -- ftpd Proxy Server Group ======================================
        fwFtpdSvrGrp OBJECT IDENTIFIER ::= {fwMib 7}

        fwFtpdSvrName OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
            DESCRIPTION       "The name of the FW server."
             --               The string is "pftpd"
            ::= {fwFtpdSvrGrp 1}

        fwFtpdSvrSocketType OBJECT-TYPE
            SYNTAX            DisplayString (SIZE (0..50))
            ACCESS            read-only
            STATUS            mandatory
```

```
        DESCRIPTION       "The type of socket the server is using."
         --               The string can be one of the following:
         --                     "stream"
         --                     "dgram"
         --                     "sunrpc_udp"
         --                     "sunrpc_tcp"
        ::= {fwFtpdSvrGrp 2}

    fwFtpdSvrProtocol OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The communication protocol the server is using."
         --               The string can be one of the protocols found in the
         --               file /etc/protocols.
        ::= {fwFtpdSvrGrp 3}

    fwFtpdSvrWait OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The wait/no wait attribute of the server."
         --               The string can be one of the following:
         --                     "wait"
         --                     "nowait"
        ::= {fwFtpdSvrGrp 4}

    fwFtpdSvrUser OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The user who invoked the server."
        ::= {fwFtpdSvrGrp 5}

    fwFtpdSvrProgram OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Full pathname of the server that inetd should execute."
        ::= {fwFtpdSvrGrp 6}

    fwFtpdSvrArgs OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Command line arguments used in starting the server."
        ::= {fwFtpdSvrGrp 7}

-- telnetd Proxy Server Group ====================================
    fwTelnetdSvrGrp OBJECT IDENTIFIER ::= {fwMib 8}

    fwTelnetdSvrName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW server."
         --               The string is "ptelnetd"
        ::= {fwTelnetdSvrGrp 1}

    fwTelnetdSvrSocketType OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
```

```
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The type of socket the server is using."
         --               The string can be one of the following:
         --                     "stream"
         --                     "dgram"
         --                     "sunrpc_udp"
         --                     "sunrpc_tcp"
        ::= {fwTelnetdSvrGrp 2}

    fwTelnetdSvrProtocol OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The communication protocol the server is using."
         --               The string can be one of the protocols found in the
         --               file /etc/protocols.
        ::= {fwTelnetdSvrGrp 3}

    fwTelnetdSvrWait OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The wait/no wait attribute of the server."
         --               The string can be one of the following:
         --                     "wait"
         --                     "nowait"
        ::= {fwTelnetdSvrGrp 4}

    fwTelnetdSvrUser OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The user who invoked the server."
        ::= {fwTelnetdSvrGrp 5}

    fwTelnetdSvrProgram OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Full pathname of the server that inetd should execute."
        ::= {fwTelnetdSvrGrp 6}

    fwTelnetdSvrArgs OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Command line arguments used in starting the server."
        ::= {fwTelnetdSvrGrp 7}

-- FW Mail Servers Group ======================================-
-  FwMailSvrEntry has to start with an upper case otherwise mosy gives an error

    fwMailSvrTbl OBJECT-TYPE
        SYNTAX            SEQUENCE OF FwMailSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       "A list of entries for FW mail servers configured
on this host."::= {fwMib 9}

    aFwMailSvrEntry OBJECT-TYPE
```

```
        SYNTAX            FwMailSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwMailSecDomName}
        ::= {fwMailSvrTbl 1}

    FwMailSvrEntry ::= SEQUENCE
    {
        fwMailSecDomName            DisplayString,
        fwMailSecNKSvr              DisplayString,
        fwMailPubDomName            DisplayString
    }

    fwMailSecDomName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW Secure Domain Name."
         --               The first column in /etc/security/mail.conf
        ::= {aFwMailSvrEntry 1}

    fwMailSecNKSvr OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW Secure Network Mail Server."
         --               The second column in /etc/security/mail.conf
        ::= {aFwMailSvrEntry 2}

    fwMailPubDomName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW Public Domain Name."
         --               The second column in /etc/security/mail.conf
        ::= {aFwMailSvrEntry 3}


-- Log File Management Table Group ==============================
    fwLogFileMgmtTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwLogFileMgmtEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "table of log files to be Managed"
        ::= {fwMib 10}

    aFwLogFileMgmtEntry OBJECT-TYPE
        SYNTAX            FwLogFileMgmtEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwLogFileName}
        ::= {fwLogFileMgmtTbl 1}

    FwLogFileMgmtEntry ::= SEQUENCE
    {
        fwLogFileName         DisplayString,
        fwLogDaysInLog        INTEGER,
        fwLogArchive          DisplayString,
        fwLogDaysInArc        INTEGER,
```

```
        fwLogWorkSpace        DisplayString,
        fwLogComments         DisplayString
    }

    fwLogFileName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Name of the log file to be Managed."
        ::= {aFwLogFileMgmtEntry 1}

    fwLogDaysInLog OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Days to keep in logfile."
        ::= {aFwLogFileMgmtEntry 2}

    fwLogArchive OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Archive name."
        ::= {aFwLogFileMgmtEntry 3}

    fwLogDaysInArc OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Days to keep in archive."
        ::= {aFwLogFileMgmtEntry 4}

     fwLogWorkSpace OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "directory where log Management operations
        take place."
        ::= {aFwLogFileMgmtEntry 5}

     fwLogComments OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "comments."
        ::= {aFwLogFileMgmtEntry 6}

-- FW Server Status Table Group ==============================
    fwSvrStatTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwSvrStatEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "A list of status entries for FW servers configured on
        this host."
        ::= {fwMib 11}

    aFwSvrStatEntry OBJECT-TYPE
        SYNTAX            FwSvrStatEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
```

```
        INDEX             {fwSvrStatServerName}
        ::= {fwSvrStatTbl 1}

    FwSvrStatEntry ::= SEQUENCE
    {
        fwSvrStatServerName           DisplayString,
        fwSvrStatServerState          DisplayString
    }

    fwSvrStatServerName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW or inet server."
         --               The string can be one of the following:
         --                     "fwsubagt"
         --                     "inetd"
         --                     "fwpagerd"
         --                     "fwmaild"
         --                     "named"
        ::= {aFwSvrStatEntry 1}

    fwSvrStatServerState OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Is the server running?"
         --               The string can be one of the following:
         --                     "unknown"
         --                     "running"
         --                     "not running"
        ::= {aFwSvrStatEntry 2}

-- FW Server Concurrency Status Table Group ===================
    fwSvrConStatTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwSvrConStatEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     ""
        ::= {fwMib 12}

    aFwSvrConStatEntry OBJECT-TYPE
        SYNTAX            FwSvrConStatEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwSvrConStatServerName}
        ::= {fwSvrConStatTbl 1}

    FwSvrConStatEntry ::= SEQUENCE
    {
        fwSvrConStatServerName          DisplayString,
        fwSvrConStatSessions         INTEGER
    }

    fwSvrConStatServerName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The name of the FW."
         --               The string can be one of the following:
```

```
         --                    "FTPD Proxy"
         --                    "Telnetd Proxy"
         --                    "SOCKS Server"
         --                    "Http Proxy"
        ::= {aFwSvrConStatEntry 1}

    fwSvrConStatServerSessions OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Number of concurrent sessions."
        ::= {aFwSvrConStatEntry 2}


-- FW Configuration File Table Group ==============================
    fwCfgFileTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwCfgFileEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "Information about FW and FW-related configuration files."
        ::= {fwMib 13}


    aFwCfgFileEntry OBJECT-TYPE
        SYNTAX            FwCfgFileEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwCfgFileName}
        ::= {fwCfgFileTbl 1}

    FwCfgFileEntry ::= SEQUENCE
    {
        fwCfgFileName         DisplayString,
        fwCfgUser             DisplayString,
        fwCfgGroup            DisplayString,
        fwCfgTimeStamp        DisplayString,
        fwCfgSize             INTEGER,
        fwCfgStatus           INTEGER,
        fwCheckSum            INTEGER
    }

    fwCfgFileName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The monitored file."
        ::= {aFwCfgFileEntry 1}

    fwCfgUser OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The user who owns the file."
        ::= {aFwCfgFileEntry 2}

    fwCfgGroup OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The file's primary group."
```

```
        ::= {aFwCfgFileEntry 3}

    fwCfgTimeStamp OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Current timestamp."
        ::= {aFwCfgFileEntry 4}

    fwCfgSize OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "File size in bytes."
        ::= {aFwCfgFileEntry 5}

    fwCfgStatus OBJECT-TYPE
        SYNTAX            INTEGER
        {
            vUnknown       (0),
            vNotFound      (1),
            vFound         (2)
        }
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Is the file found?"
        ::= {aFwCfgFileEntry 6}


    fwCheckSum OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "checksum on the file"
        ::= {aFwCfgFileEntry 7}


-- FW Filter Status Group ========================================
    fwFilterStatGrp OBJECT IDENTIFIER
 ::= {fwMib 14}

    fwFilterNumIfs OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Number of secure interfaces defined."
        ::= {fwFilterStatGrp 1}

    fwFilterNumRules OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Number of rules in filter list."
        ::= {fwFilterStatGrp 2}

    fwFilterLevel OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Netinet filter support code level."
        ::= {fwFilterStatGrp 3}
```

```
-- XXX Can status be anything other than 'not available'?
    fwFilterStat OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Status of filter support code."
        ::= {fwFilterStatGrp 4}

-- XXX Can status be anything other than 'not available'?
    fwPktLogStat OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..50))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Status of packet logging."
        ::= {fwFilterStatGrp 5}

    fwFilterRulesTimeStamp OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Timestamp of last update to rules."
        ::= {fwFilterStatGrp 6}

    fwFilterNumRulesUpdates OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Number of updates to rules since initialization."
        ::= {fwFilterStatGrp 7}


-- Network Configuration Group ==================================
    fwNetCfgGrp OBJECT IDENTIFIER
 ::= {fwMib 15}

    fwSecDomName OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Secure domain name."
        ::= {fwNetCfgGrp 1}

    fwNonSecDomSvrTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwNonsecDomSvrEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     ""
        ::= {fwNetCfgGrp 2}

    aFwNonsecDomSvrEntry OBJECT-TYPE
        SYNTAX            FwNonsecDomSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwNonSecSvraddr}
        ::= {fwNonSecDomSvrTbl 1}

    FwNonsecDomSvrEntry ::= SEQUENCE
    {
        fwNonSecSvrAddr           DisplayString
```

```
    }

    fwNonSecSvrAddr OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       ""
        ::= {aFwNonsecDomSvrEntry 1}

    fwSecDomSvrTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwSecDomSvrEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     ""
        ::= {fwNetCfgGrp 3}

    aFwSecDomSvrEntry OBJECT-TYPE
        SYNTAX            FwSecDomSvrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwSecSvrAddr}
        ::= {fwSecDomSvrTbl 1}

    FwSecDomSvrEntry ::= SEQUENCE
    {
        fwSecSvrAddr           DisplayString
    }

    fwSecSvrAddr OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       ""
        ::= {aFwSecDomSvrEntry 1}


-- Threshold Configuration Group ===================================
    fwThrCfgGrp OBJECT IDENTIFIER ::= {fwMib 16}

    fwMailToTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwMailToEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "Table of users to notify of threshold violations"
        ::= {fwThrCfgGrp 1}

    aFwMailToEntry OBJECT-TYPE
        SYNTAX            FwMsgThrEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwMailToId}
        ::= {fwMailToTbl 1}

    FwMailToEntry ::= SEQUENCE
    {
        fwMailToId              DisplayString,
        fwMailToComments        DisplayString
    }
```

```
fwMailToId OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "mail address to send threshold violation notice to"
    ::= {aFwMailToEntry 1}

fwMailToComments OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "comments"
    ::= {aFwMailToEntry 2}

fwCommand OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "program executed when threshold is reached."
    ::= {fwThrCfgGrp 2}

fwCommandComments OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "comments"
    ::= {fwThrCfgGrp 3}

fwSnglAuthThrCount OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "number of failed authentication messages to be detected."
    ::= {fwThrCfgGrp 4}

fwSnglAuthThrTime OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Number of minutes to detect failed auth messages."
    ::= {fwThrCfgGrp 5}

fwSnglAuthPagerAlert OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..20))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Pager notification"
    ::= {fwThrCfgGrp 6}

fwSnglAuthThrComments OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "comments"
    ::= {fwThrCfgGrp 7}

fwMultAuthThrCount OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "number of failed authentication messages to be detected."
```

```
    ::= {fwThrCfgGrp 8}

fwMultAuthThrTime OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Number of minutes to detect failed auth messages."
    ::= {fwThrCfgGrp 9}

fwMultAuthPagerAlert OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..20))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Pager notification"
    ::= {fwThrCfgGrp 10}

fwMultAuthThrComments OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "comments"
    ::= {fwThrCfgGrp 11}


fwHostAuthThrCount OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "number of failed authentication messages to be detected."
    ::= {fwThrCfgGrp 12}

fwHostAuthThrTime OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Number of minutes to detect failed auth messages."
    ::= {fwThrCfgGrp 13}

fwHostAuthPagerAlert OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..20))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Pager notification"
    ::= {fwThrCfgGrp 14}

fwHostAuthThrComments OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..255))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "comments"
    ::= {fwThrCfgGrp 15}

fwMsgThrTbl OBJECT-TYPE
    SYNTAX          SEQUENCE OF FwMsgThrEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     "Table of message threshold definition entries"
    ::= {fwThrCfgGrp 16}

aFwMsgThrEntry OBJECT-TYPE
    SYNTAX            FwMsgThrEntry
```

```
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwMsgThrTag}
        ::= {fwMsgThrTbl 1}

    FwMsgThrEntry ::= SEQUENCE
    {
        fwMsgThrTag           DisplayString,
        fwMsgThrCount         INTEGER,
        fwMsgThrTime          INTEGER,
        fwMsgThrPagerAlert    DisplayString,
        fwMsgThrComments      DisplayString
    }

    fwMsgThrTag OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       ""
        ::= {aFwMsgThrEntry 1}

    fwMsgThrCount OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "number of failed authentication messages to be detected."
        ::= {aFwMsgThrEntry 2}

    fwMsgThrTime OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Number of minutes to detect failed auth messages."
        ::= {aFwMsgThrEntry 3}


     fwMsgThrPagerAlert OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Pager notification."
        ::= {aFwMsgThrEntry 4}


    fwMsgThrComments OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..255))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       ""
        ::= {aFwMsgThrEntry 5}


-- FW Active IP Tunnel Table Group ================================
   fwActiveTunnelGrp OBJECT IDENTIFIER ::= {fwMib 17}

    fwIbmTunnelTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwIbmTunnelEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "List of all IBM Tunnels "
```

```
        ::= {fwActiveTunnelGrp 1}

    aFwIbmTunnelEntry OBJECT-TYPE
        SYNTAX          FwIbmTunnelEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     "A list of all IBM Tunnels."
        INDEX           {fwIbmTunnelId}
        ::= {fwIbmTunnelTbl 1}

    FwIbmTunnelEntry ::= SEQUENCE
    {
        fwIbmTunnelId      INTEGER,
        fwIbmSrcAddr       DisplayString,
        fwIbmDestAddr      DisplayString,
        fwIbmEncrption    DisplayString,
        fwIbmPolicy        DisplayString,
        fwIbmSessionLife   INTEGER,
        fwIbmInitFlag      DisplayString
    }

    fwIbmTunnelId OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The Identification number of the IBM Tunnel."
        ::= {aFwIbmTunnelEntry 1}

    fwIbmSrcAddr OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The IP address of the local firewall."
        ::= {aFwIbmTunnelEntry 2}

    fwIbmDestAddr OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..100))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "The IP address of the partner firewall."
        ::= {aFwIbmTunnelEntry 3}

    fwIbmEncryption OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Algorithm used for IP Packet encryption ."
        --                possible values are DES_CBC_8, CDMF, DES_CBC_4
        ::= {aFwIbmTunnelEntry 4}

    fwIbmPolicy OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION    "combination of encryption and authentication values."
        --                Possible values are encr/auth, auth/encr, encr only,
                           auth only, none
::= {aFwIbmTunnelEntry 5}

    fwIbmSessionLife OBJECT-TYPE
        SYNTAX            INTEGER
```

```
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Time in minutes current session can be used."
    --                Max time is 1440.
    ::= {aFwIbmTunnelEntry 6}


fwIbmInitFlag OBJECT-TYPE
    SYNTAX          DisplayString (SIZE (0..20))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Identifies which partner starts the session
                             negotiation."
    --                Possible values are yes, no
    ::= {aFwIbmTunnelEntry 7}


fwManTunnelTbl OBJECT-TYPE
    SYNTAX          SEQUENCE OF FwManTunnelEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     ""
    ::= {fwActiveTunnelGrp 2}

aFwManTunnelEntry OBJECT-TYPE
    SYNTAX          FwManTunnelEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     "A list of all MAN Tunnels."
    INDEX           {fwManTunnelId}
    ::= {fwManTunnelTbl 1}

FwManTunnelEntry ::= SEQUENCE
{
    fwManTunnelId      INTEGER,
    fwManSrcAddr       DisplayString,
    fwManDestAddr      DisplayString,
    fwManEncryption    DisplayString,
    fwManPolicy        DisplayString,
    fwManSessionLife   INTEGER,
    fwManTargetSPI     INTEGER
}

fwManTunnelId OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "The Identification number of the Man Tunnel."
    ::= {aFwManTunnelEntry 1}

fwManSrcAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "The IP address of the local firewall."
    ::= {aFwManTunnelEntry 2}

fwManDestAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
```

```
        DESCRIPTION       "The IP address of the partner firewall."
        ::= {aFwManTunnelEntry 3}

    fwManEncryption OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Algorithm used for IP Packet encryption ."
        --                possible values are DES_CBC_8, CDMF, DES_CBC_4
        ::= {aFwManTunnelEntry 4}

    fwManPolicy OBJECT-TYPE
        SYNTAX            DisplayString (SIZE (0..20))
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "combination of encryption and authentication values."
        --                Possible values are encr/auth, auth/encr, encr only,
                           auth only, none
        ::= {aFwManTunnelEntry 5}

    fwManSessionLife OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Time in minutes manual tunnel will be operational."
        --                Max time is 44640.
        ::= {aFwManTunnelEntry 6}


    fwManTargetSpi OBJECT-TYPE
        SYNTAX            INTEGER
        ACCESS            read-only
        STATUS            mandatory
        DESCRIPTION       "Target Security Parameter Index for manual tunnel."
        --                Valid values are 1- 9999
        ::= {aFwManTunnelEntry 7}


-- FW Network Address Translation Group ==========================
      fwNatAddrTransGrp OBJECT IDENTIFIER
 ::= {fwMib 18}

    fwNatReservedTbl OBJECT-TYPE
        SYNTAX          SEQUENCE OF FwResvRegisterEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION     ""
        ::= {fwNatAddrTransGrp 1}

    aFwResvRegisterEntry OBJECT-TYPE
        SYNTAX            FwResvRegisterEntry
        ACCESS            not-accessible
        STATUS            mandatory
        DESCRIPTION       ""
        INDEX             {fwRegisteredIpAddr}
        ::= {fwNatReservedTbl 1}

    FwResvRegisterEntry ::= SEQUENCE
    {
        fwRegisteredIpAddr      DisplayString,
        fwRegisteredIpAddrMask  DisplayString,
```

```
    fwNatTimeout            INTEGER
}

fwRegisteredIpAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Defines the IP addresses for outbound connections"
    ::= {aFwResvRegisterEntry 1}


 fwRegisteredIpMask OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "The mask specifies the bits in the registered IP
    addr used to add a range of IP addr to the registered addr pool."
    ::= {aFwResvRegisterEntry 2}


 fwNatTimeout OBJECT-TYPE
    SYNTAX            INTEGER
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "minutes an address translation can remain idle."
    ::= {aFwResvRegisterEntry 3}


fwNatTranslateTbl OBJECT-TYPE
    SYNTAX          SEQUENCE OF FwNatTranslateEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     ""
    ::= {fwNatAddrTransGrp 2}

aFwNatTranslateEntry OBJECT-TYPE
    SYNTAX            FwNatTranslateEntry
    ACCESS            not-accessible
    STATUS            mandatory
    DESCRIPTION       ""
    INDEX             {fwTranslateSecIpAddr}
    ::= {fwNatTranslateTbl 1}

FwNatTranslateEntry ::= SEQUENCE
{
     fwTranslateSecIpAddr     DisplayString,
     fwTranslateSecIpAddrMask DisplayString
}

fwTranslateSecIpAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Defines the IP addresses to be excluded from NAT"
    ::= {aFwNatTranslateEntry 1}


 fwTranslateSecIpAddrMask OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
```

```
    DESCRIPTION       "The mask specifies the bits in the secured IP addr
    used to identify a range of IP addr."
    ::= {aFwNatTranslateEntry 2}


fwNatExcludeTbl OBJECT-TYPE
    SYNTAX          SEQUENCE OF FwNatExcludeEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     ""
    ::= {fwNatAddrTransGrp 3}

aFwNatExcludeEntry OBJECT-TYPE
    SYNTAX            FwNatExcludeEntry
    ACCESS            not-accessible
    STATUS            mandatory
    DESCRIPTION       ""
    INDEX             {fwExcludeSecIpAddr}
    ::= {fwNatExcludeTbl 1}

FwNatExcludeEntry ::= SEQUENCE
{
     fwExcludeSecIpAddr     DisplayString,
     fwExcludeSecIpAddrMask DisplayString
}

fwExcludeSecIpAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "Defines the IP addresses to be excluded from NAT"
    ::= {aFwNatExcludeEntry 1}


 fwExcludeSecIpAddrMask OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "The mask specifies the bits in the secured IP
    addr used to identify a range of IP addr."
    ::= {aFwNatExcludeEntry 2}


fwNatMapTbl OBJECT-TYPE
    SYNTAX          SEQUENCE OF FwNatMapEntry
    ACCESS          not-accessible
    STATUS          mandatory
    DESCRIPTION     ""
    ::= {fwNatAddrTransGrp 4}

aFwNatMapEntry OBJECT-TYPE
    SYNTAX            FwNatMapEntry
    ACCESS            not-accessible
    STATUS            mandatory
    DESCRIPTION       ""
    INDEX             {fwMapSecIpAddr}
    ::= {fwNatMapTbl 1}

FwNatMapEntry ::= SEQUENCE
{
     fwMapSecIpAddr     DisplayString,
```

```
     fwMapRegisteredIpAddr DisplayString
}

fwMapSecIpAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "IP address to be translated into a specified
    registered IP addr"
    ::= {aFwNatMapEntry 1}


 fwMapRegisteredIpAddr OBJECT-TYPE
    SYNTAX            DisplayString (SIZE (0..100))
    ACCESS            read-only
    STATUS            mandatory
    DESCRIPTION       "IP address into which a specified secured IP address
    should be translated."
    ::= {aFwNatMapEntry 2}

fwNatStatus OBJECT-TYPE
    SYNTAX          DisplayString (SIZE (0..20))
    ACCESS          read-only
    STATUS          mandatory
    DESCRIPTION     "The status of Network Address Translation"
    --              The possible values are active, deactive.
    ::= {fwNatAddrTransGrp 5}


fwNatLogStatus OBJECT-TYPE
    SYNTAX          DisplayString (SIZE (0..20))
    ACCESS          read-only
    STATUS          mandatory
    DESCRIPTION     "Logging status of Network Address Translation"
    --              The possible values are enabled, disabled
    ::= {fwNatAddrTransGrp 6}


END
```

Appendix D. The Socks Configuration Files

The IBM Firewall socks server, when enabled, provides a circuit gateway between the secure and the non-secure networks. The server's main task is to determine which connections must be permitted or denied through the firewall, or which ones to redirect to a standard (non-socks) server. There are a number of decision rules that can be applied for this determination. These rules are specified in a configuration file which the socks server reads at firewall bootup time, or whenever it is restarted.

The main configuration file, socks5.conf, is located in "/etc/security". An intermediate configuration file, s5.conf, is created directly from socks5.conf and is also located in "/etc/security". Whereas user-specified rules are saved in socks5.conf, the socks server only reads the resulting s5.conf.

This appendix describes two configuration specification languages, one for each of the configuration files. First, we will present the socks5.conf file format followed by the s5.conf format.

The socks5.conf Configuration File

The socks5.conf configuration file is produced from three IBM Firewall configuration files through an explosion process.

These files include explode.cfg, socks5.header.cfg, sockd.conf. The socks5.conf format consists of the following sections:

- Aliases
- Variables
- Modules
- Authentication
- Routing
- Proxies
- Access-Control

Specifying Ports

Ports can be specified using either a name, number, or range. Ranges begin with either a [or (and end with either a) or a] depending on whether or not the range is inclusive. Within the range delimiters should be two port specifiers (names or numbers), separated by a comma. The method of specifying ports is referred to as the *port pattern*.

Specifying Hosts

Host addresses and netmasks are often needed for specifying which hosts apply for a given rule. This method of specifying hosts is referred to as the *host pattern*. There are several ways to specify the host/mask pair:

Parameter	Description
hostIP/ mask	A host address ″ANDed″ with the mask must be the same as host IP ″ANDed″ with the mask. This is usually used to mask out the host portion of the address from the network or subnetwork portion.
-	Anything matches. All hosts are allowed.
n1	Equivalent to n1.0.0.0/255.0.0.0.
n1.n2	Equivalent to n1.n2.0.0/255.255.0.0.
n1.n2.n3	Equivalent to n1.n2.n3.0/255.255.255.0.
.domain.name	The host name must end with the string *.domain.name.*
a.host.name	The hostname must match exactly *a.host.name.*

There is also support for the older host pattern syntax, as described below. However, the newer method is recommended and easier to read.

Parameter	Description
hostIP/a	Anything matches (same as ″-″). All hosts are allowed.
hostIP/n	Network match. Masks out the host and subnet portions of the address, leaving only the network portion. The mask used to do this depends on the class of host IP address.
hostIP/s	Subnet match. Masks out the host portion of the address, leaving only the subnet and network portion. The mask used to do this depends on the class of host IP address.
hostIP/h	Host match. Equivalent to host IP.

Specifying Authentication Methods

The authentication methods shipped with the IBM Firewall are *ibmcram* and *ibmpwd*. Others can be added.

Authentication methods can be specified as a list of methods separated by commas. For a line to match, the chosen authentication method has to be represented by one of the methods in the list. This syntax is referred to as an *auth pattern*. The authentication method NULL is defined by default. Other methods may be included by loading the appropriate modules. A″-″ indicates any authentication method, including NULL, is acceptable.

Authentication Entries

The authentication entries indicate the types of authentication that can be used. The format is:

```
auth/ban   source-address  source-port auth-methods
```

Parameter	Description
auth/ban	Whether the authentication entries are authorized (auth) or not (ban).
source-address	A valid host pattern.
source-port	A valid port pattern.
auth-methods	A valid auth pattern.

The keyword ″ban″ indicates that authentication should not even be attempted with this host and has no valid use for the specified server.

If no auth/ban lines are specified, the default is that any authentication method is acceptable. If the permission for the connection is set to *deny* (the default), the connection would not be rejected until after authentication has been applied. In the SOCKS5 protocol, authentication takes place before authorization.

Specifying Commands

Commands can also be specified as a list of commands separated by commas. This syntax is referred to as a command pattern. The commands defined are: **connect**, **bind**, **udp**, **ping**, and **traceroute**. Other commands may be added by loading the appropriate modules. A ″-″ (dash) indicates any command is acceptable.

Loading Modules

Modules allow custom expansion to server functionality by adding new authentication methods, commands, authorization checks, and content filters. The format is: *module stub filename options*

Parameter	Description
module	The identifier of the module to load.
stub	A module-dependent name prefix for accessing function names.
filename	The file name for the module to load.
options	Module-specific configuration information, if any.

Modules may define fields used elsewhere, so it is best to put module lines first. For example, authentication modules define authentication method names used in auth and permit lines.

Routing Entries

On machines with multiple network interfaces (hence, IP addresses), it is desirable to make sure that certain network interfaces are used in conjunction with certain addresses. This prevents ″IP spoofing″ (where machines outside the network pretending to be machines inside the network), by making sure that inside machines use the inside network interface and outside machines use the outside network interface. It is also used by the SOCKS server in determining the network interface to bind on when accepting a BIND request, or when issuing a SENDTO request. If no entry matches, INADDR_ANY is used to bind, and a connection can be received on any interface. Single-homed hosts need not have routing entries: they are only necessary for machines with more than one network interface. The format for the routing-entry object is:

```
card = string;
```

Parameter	Description
route	Keyword to indicate the routing entries.
dest-address	A valid host pattern.
dest-port	A valid port pattern.
interface-address	Either the IP address of a network interface card, or the name of the network interface (for example, elnk31).

Variable Entries

The amount and types of logging and informational messages can be controlled by certain variables and flags in the configuration file. The format is: **set** *variable value*

Parameter	Description
set	Keyword to set the environment variable entries for local use.
variable	A valid environment variable. Refer to “Environment Variables” below for a listing of the available variables.
value	The value to assign.

Environment Variables

Environment Variable	Description
SOCKS5_BINDPORT [port]	Configures IBM Firewall to use the specified port, rather than the default of port 1080.
SOCKS5_RECVFROMANYONE	If UDP support is enabled, this allows the UDP clients to receive messages from unknown senders.
SOCKS5_USECLIENTSPORT	Configures IBM Firewall to proxy only if it can bind to the same port the client uses to send messages. This is necessary for proxying UDP connections when the server is streaming data to the client (sending messages to the client before the client sends messages to the server). An example of this usage would be RealAudio.

Environment Variable	Description
SOCKS5_MAXCHILD	The maximum number of concurrent threads.
SOCKS5_NOREVERSEMAP	Disables mapping of IP addresses to host names. If aliases are assigned in the configuration file, this would increase performance at the expense of logging information.
SOCKS5_NOSERVICENAME	Disables mapping of port numbers to service names. If aliases are assigned in the configuration file, this would increase performance at the expense of logging information.
SOCKS5_NOIDENT	Disables IDENT requests, even if compiled in. This is useful when you have a slow link to clients, and they are not using IDENTD. This will reduce the timeout periods.
SOCKS5_DEMAND_IDENT	Configures NULL authentication to fail if there is no IDENT response from clients. This is useful for ensuring that a user name is always associated with a connection request.

Proxy Entries

Proxy entries describe the addresses of SOCKS proxy servers. These lines tell the server how to contact a given host. If no lines match a host, the host is contacted directly. The format is: *proxy-type dest-addr dest-port proxy-addr proxy-port*

Parameter	Description
proxy_type	The type of proxy server. Valid entries are: • socks5 • socks4 • no proxy
dest-address	A valid host pattern.
dest-port	A valid port pattern.
proxy-address	Either the IP address or the name of the proxy server.
proxy-port	The proxy server port on which the SOCKS daemon is accepting connections.

Access Control Entries

The access control section determines whether a request to establish a connection is permitted or denied. There are two types of lines, permit lines and deny lines. Each entry on the line must match for the entire line to match. The format is:

```
permit auth cmd src-host dest-host src-port dest-port [userlist]
deny auth cmd src-host dest-host src-port dest-port [userlist]
```

Parameter	Description
auth	A list of authentication methods, specified by a valid auth pattern and auth entry.

Parameter	Description
cmd	A valid command pattern specifying the commands that are matched by this line.
scr-host	A valid host pattern for the source host.
dest-host	A valid host pattern for the destination host.
scr-port	A valid port pattern for the source host port.
dest-port	A valid port pattern for the destination host port.
userlist	A valid user pattern.

Filters

Filtering through a loaded module is performed by the filter directive. The format is:

```
filter  name auth cmd src-host dest-host src-port
dest-port [userlist]
```

Parameter	Description
name	The identifier of the filter module.
auth	A list of authentication methods, specified by a valid auth pattern and auth entry.
cmd	A valid command pattern specifying the commands that are matched by this line.
scr-host	A valid host pattern for the source host.
dest-host	A valid host pattern for the destination host.
scr-port	A valid port pattern for the source host port.
dest-port	A valid port pattern for the destination host port.
userlist	A valid user pattern.

Example of a socks5.conf file

```
#==================================================================
# socks5.header.cfg
# Constant settings which are prepended to all socks configs
#
# Change History:
# $01 20335 02041998 herbw Corrected the SOCKS5_DEMANDIDENT parameter
#
#==================================================================

#==================================================================
# Set behavioral parameters
#==================================================================
# Don't look up names to go with addresses (works faster this way)
set SOCKS5_NOREVERSEMAP 1
# Don't look up service names to go with port numbers (works faster)
set SOCKS5_NOSERVICENAME 1
# Disable identd requests
set SOCKS5_NOIDENT 1
# Use client port (necessary for proxying streaming-UDP
set SOCKS5_USECLIENTSPORT 1
# Set idle timeout in minutes
timeout 15 minutes
```

```
#==================================================================
# Unused behavioral parameters
#==================================================================
# Change the inbound TCP port (default=1080)
# set SOCKS5_BINDPORT 1080
# Allow unsolicited UDP messages
# set SOCKS5_RECVFROMANYONE
# Set maximum number of concurrent children
# set SOCKS5_MAXCHILD x
# Authenticate socks4 clients with identd
# set SOCKS5_DEMANDIDENT


#==================================================================
# Machine-generated information follows...
#==================================================================

#==================================================================
# socks5.profile2.cfg
# Migration-mode socks configuration profile
# Allows all socks4 users to connect from secure networks, but
# requires socks5 clients to authenticate.  Socks4 users from
# nonsecure networks are denied, socks5 users from nonsecure
# networks must be authenticated.
#==================================================================

#------------------------------------------
# Authentication modules
#------------------------------------------
module server_password_IBM /usr/lib/ibm_gwauthp.mod
module server_cram_IBM /usr/lib/ibm_gwauthc.mod

#------------------------------------------
# Routing information
#------------------------------------------
route 9.37.58.54/255.255.240.0 - 9.37.58.54
route 10.1.1.15/255.255.255.0 - 10.1.1.15

#------------------------------------------
# Authentication configuration
# (Determines the authentication methods used
#  by incoming client requests)
#------------------------------------------
auth 9.37.58.54/255.255.240.0 - ibmpwd,ibmcram
auth 10.1.1.15/255.255.255.0 - null,ibmpwd,ibmcram
auth - - ibmpwd,ibmcram
```

The s5.conf Configuration file

The `socks5.conf` is a file that is produced/created automatically upon activating the `sockd` rules. For more information about `sockd`, see the IBM SecureWay Firewall User's Guide. The SOCKS server however, does not read this configuration file directly. An intermediate configuration file is created from `socks5.conf` which is then read by the Socks 5 server upon boot-up or whenever it is refreshed. This file is `/etc/security/s5.conf`, and has a different format. Both `socks5.conf` and `s5.conf` can be edited manually. However, we advise that only authorized expert firewall administrators do this, especially if there is no special reason to edit the files by hand. A utility program called `"fwS5convert"` is executed automatically to create `s5.conf`.

Caveat: Regenerating filter rules overwrites `socks5.conf` and `s5.conf`. You need to run `"fwS5convert socks5.conf s5.conf"` whenever `socks5.conf` is edited manually

to produce s5.conf. Also, whenever filter rules are regenerated through the GUI or command line, socks5.conf will be overwritten. Therefore, anything that should be saved in between rule explosions should be placed in socks5.header.conf. For more information about socks5.header.conf, see the IBM SecureWay Firewall User's Guide.

Data Types

There are five basic data types in the configuration file:

- tokens
- booleans
- integers
- simple strings
- strings

The following object is used as an example in the definitions below.

```
installation@converted_installation
{
         comment = "Automatically converted from v2.x file:
                    socks.conf"
          port   = 1080
      reversedns = TRUE;
}
```

Tokens

Tokens are the internal keywords that the parser recognized. Tokens determine the type of data that can come after them. In the example above, installation, comment, port, reversedns, and TRUE are all tokens. Tokens are not case-sensitive. Tokens should never be contained within quotation marks.

Booleans

Booleans can either be TRUE or FALSE. TRUE and FALSE are tokens that the parser recognizes internally. In the example above, TRUE is a boolean.

Booleans are not case-sensitive. Booleans should never be contained within quotations marks.

Integers

An integer can be any sequence of numbers. In the example above, 1080 is an integer. Numbers cannot be negative, and floating point numbers are not allowed.

Simple Strings

A simple string must start with "@" symbol, and must contain only alphabetic characters (a-z or A-Z), digits (0–9), and/or underscores (_). In the example above, @converted_installation is a simple string.

Strings

To avoid parse errors, a typical string is usually contained within quotation marks; this can reduce confusion between strings and tokens that otherwise appear identical.

In cases where quotation marks must be included within the string, basic escape mechanisms are available. To include a quotation mark within a string type, use ″\″. To include a literal backslash character, type ″\\″. Placing any other character directly after a backslash (\) simply inserts that character. In the example above, ″Automatically converted from v2.x file:socks5.conf″ is a string in quotation marks.

Common Attributes

Any object(s) can have the comment = STRING attribute included within the object body. This freeform string can contain information about the object. It is not parsed by the server or the graphic user interface (GUI) administration tool in any way. It is strictly for informational purposes.

Order of Objects

You must define all objects before using them. (This limitation will be removed in a future release of the IBM SecureWay Firewall.) The following example would result in a parse error because ″Second Group″ is used before it is defined.

```
group "First Group"
{
          local group "Second Group";
}
group "Second Group"
{
        .
        .
        .
}
```

Defining Users and Groups

You do not need to explicitly define users and groups before using them in a rule or group definition; the users and groups are self-describing.

The standard user/group notation is ″backend:name″ where ″backend″ is a string that uniquely identifies a backend where the actual authentication information is stored, and ″name″ is the user/group name. Specifying the special backend ″any″ means that any backend should match the username.

To use a user or group in a rule or group, use the group or user keywords. For example:

```
access permit @ac10
{
          .
          .
     user "admin:root";
     group "admin:wheel";
     user "admin:dhdore";
     user "any:ichabod";
}
```

When using the same set of users in many rules, it is easier to put them into a group locally and use those groups in the rules. The ″group″ object defines a local group. You can include users, groups, and other local groups in a local group. You can also mix and match backends. For example:

```
group "Special Users"
{
     user "admin:root";
     group "admin:wheel";
     user "admin:dhdore";
     user "any:ichabod";
}
access permit @ac11
{
        .
        .
    local group "Special Users;
}
```

Defining Networks

To define networks and hosts, use the network object. There are four types of networks; they all follow the same pattern in the configuration file:

```
network  "name"
{
      key1 = value1;
      key2 = value2;
          .
          .
          .
      keyn = valuen
}
```

The type determines which keys are valid.

- *Domain*: This type of network is used to match an entire domain of machines. The domain keyword is used to define the domain. For example:

  ```
  network domain "GNU Domain"
  {
     domain = "gnu.org";
  }
  ```

  Any machine name that ends with the domain matches. Examples of matches and mismatches:

  ```
  www.ibm.com IS in .ibm.com
  www.ibm.com IS NOT in .bob.ibm.com
  patrick.in.ibm.com IS in .ibm.com
  ```

- *Host*: This matches a specific machine. You can match the host machine with either the IP address or the hostname keywords. The IP address should be in dotted-decimal notation, and the hostname should be a string. For example:

  ```
  network host "Mythical machine"
  {
      ipaddress = "123.456.7.8";
  }
  network host "Another Mythical machine"
  {
       hostname = "test.test.ick.bin.org";
  }
  ```

  Hostname comparisons are case-insensitive; therefore, WWW.iBm.com matches www.ibm.com, and vice– versa.

- *Subnet*: You can define an entire subnet with this type of network. The IP address and netmask keywords recognized and should be in the standard dotted-decimal notation. For example:

```
network subnet "123.456.7.8.xxx Subnet"
{
         ipaddress = "123.456.7.1";
           netmask = "255.255.255.0":
}
```

- *Range*: Occasionally, a grouping of machines cannot easily be described with a subnet mask. A network can also be a consecutive range of IP addresses. The from and to keywords specify the beginning and end of a range in dotted-decimal notation. For example:

```
network range "Subrange of 123.456.7.xxx"
{
           from = "123.456.7.5";
             to = "123.456.7.25";
}
```

The range is inclusive, which means that the endpoints are included in the range. In the example above, ″123.456.7.5″ and ″123.456.7.25″ would match the specified range.

Defining SOCKS Server

SOCKS server definitions are used in proxy chaining rules. The following table explains the attributes that you can specify.

Parameter	Description
hostname	The hostname of the SOCKS server. If you specify the hostname, you do not need to specify the IP address.
ipaddress	The hostname of the SOCKS server in dotted-decimal notation. If you specify the IP address, you do not need to specify the hostname.
port	The port number that the server is listening on.
version	The SOCKS protocol version that server speaks. Valid version numbers are ″4″ and ″5″.

An example of a SOCKS server definition is:

```
server "slow";
{
     hostname = "slow";
    ipaddress = "9.37.56.68"
         port = 1080;
      version = 5;
}
```

Rules

There are five types of rules that determine how a connection will be handled:

- Authentication
- Access-control
- Filters

- Routing Entries
- Proxy-chaining

Rules are evaluated in the order in which you list them in the installation object. The server applies the first matching rule to the connection, then the second matching rule, and so on.

Rules	Description
enabled	Controls whether or not the rule will actually be considered when the server looks for matches. If FALSE, it will be skipped completely. This is useful for temporarily disabling a certain set of access rights.
network source name	Specifies that the user's connection must originate from the network source for the rule to apply.
network group source name	Specifies that the user's connection must originate from the network source for the rule to apply.
source services	Specifies that the user's connection must originate from any of the listed ports for the rule to apply. You can list either single services or ranges of services.
methods	Specifies that the user must authenticate using one of the methods listed for the rule to apply. For information about which authentication modules are supported, refer to ″Authentication″.
keylength	Specifies that the session must be encrypted with a key of a certain minimum length for the rule to apply. Valid key lengths are 0, 40, 56, or 128 bits.
user backend	Specifies that the authenticated user must be the named user according to the backend in order for the rule to apply.
group backend	Specifies that the authenticated user must be in the named group according to backend in order for the rule to apply.
local group name	Specifies that the authenticated user must be in the locally defined group name in order for the rule to apply.
DAY	One of Sunday, Monday, Tuesday, Wednesday, Thursday, Friday or Saturday. The right-hand side is a list of one or more time ranges, in 24-hour format. The granularity of the items is on the half hour only. Time ranges are inclusive.
startdate	Start date in mm/dd/yyyy notation.
enddate	End date in mm/dd/yyyy notation.
starttime	Start time in hh:mm notation.
endtime	End time in hh:mm notation.

Common Attributes of Rules

You can use the following attributes in any of the rule types. If you specify multiple networks, network groups, users, or groups, this becomes an ″OR″ operation. For example, the user could be ″Deb″ or ″Dale″ or ″Eric,″ etc.

Rules	Description
Authentication rule	Determines how a client will be allowed to authenticate to the server.
Access-control rule	Specifies the class(es) of connection allowed through the server. Connections can be accepted or rejected.
Filter rule	Determines whether or not a content filter needs to be applied to the data stream. This is the final decision made before starting to proxy data.
Routing entries	Specifies which network interface each machine can use.
Proxy-chaining rule	Controls which traffic (if any) will be directed through subsequent servers. This is typically used for access to partners' networks where individual users in the company do not have accounts but the company as a whole does.

Authentication

The **methods** keyword determines which authentication method(s) will be accepted from different networks. There are no new keywords available for this object type. For example:

```
authentication @ac10
{
                enabled = TRUE;
         network source = "Anywhere";
                methods = "ibmpwd" "ibmcram" "null";
}
```

Authentication methods can be specified as a list of methods separated by a space. For a line to match, the chosen authentication method has to be represented by one of the methods in the list. This syntax is referred to as an *auth pattern*. If no method is given in an authentication object, the authentication method NULL is implied. Other methods may be included by loading the appropriate modules. A″-″ indicates that any authentication method, including NULL, is acceptable.

Note: For the IBM SecureWay Firewall, the authentication module corresponding to ″ibmpwd″ is `ibm_gwauthp.mod`, while `ibm_gwauthc.mod` corresponds to ″ibmcram″. Both modules can be found in ″/usr/lib″

Modules

Authentication methods (except for the NULL method) are defined as loadable modules so that, if desired, only the necessary functionality can be loaded into memory. Loadable modules also allow for in-house development of custom authentication methods.

You must complete three steps before a server can actually use a module.

1. You must load the module
2. Apply the module to a specific installation
3. Use the module in an access-control, authentication, or filter rule

Loading a Module

You must load each module individually in the module section. A module entry contains all configuration information for the module. The following is an example of a module object:

```
module "http_filter"
{
      comment  = "HTTP content filter";
      filename = "c:/ibm/firewall/bin/test.mod";
      stub     = "password_method";
      option "ibm_options" = "c:/ibm/firewall/config/auth_options.conf";
}
```

Parameter	Description
filename	Specifies where the loadable module can be found. This can be a fully qualified pathname (e.g., c:\Program Files\ibm\firewall\bin\test.mod), or relative to the installation directory (e.g., Program Files\ibm\firewall\bin\test.mod)
stub	The unique identifier for the module. It is used to find all of the functions that the server needs. This is typically the name of the module, without the .mod suffix. All '-' characters will be converted to '_'.
options	All configuration information for the module includes any number of "option" statements. Options are module-specific.

Including a Module in an Installation

You must use a module in an installation before you can use it in the installation's ACL, filter, or authentication rule. To include a module in an installation, use the "module" keyword. For example:

```
installation "Converted"
{
     module "http_filter";
}
```

Referencing a Module in a Rule

Once you have loaded and included a module in an installation, any rule in that installation can reference the module. The type of module determines which referencing method to use.

- *Client-side Authentication*: Client-side modules are used only when proxy chaining, and do not need to be explicitly used in a rule. If the server you are chaining to requires authentication, all configured authentication methods will be offered in the negotiation phase, and the remote server will select the most appropriate method.

- *Server-side Authentication*: Server-side modules are used to force clients to authenticate in a certain way. Authentication methods are referenced by a short, unique string, which maps to a specific authentication method. The IBM SecureWay Firewall includes the following authentication methods by default: Username/Password, CHAP, CRAM, and Null. Other methods can be installed by third parties or local system administrators. If you are unsure of which authentication methods are available in your installation, contact your local system administrator.

To configure the server to require a certain authentication method, include that method in an authentication rule and, if necessary, in any access control or filtering rules that might require greater control than an authentication rule can provide.

The IBM SecureWay Firewall ships two authentication modules:

- **ibm_gwauthp.mod**

  which implements the username/password method
- **ibm_gwauthc.mod**

  which implements the CRAM method

Other methods can be installed by third parties or local system administrators. If you are unsure of which access-control methods are available in your installation, contact your local system administrator.

Access Control

Access-control rules determine who can go where, and when, through the server. An access-control rule specifies, in the object definition, whether it will permit or deny access to the listed resources. Each entry on the line must match for the entire line to match. For example:

```
access permit @ac10
{
enabled = TRUE;
network source "Anywhere";
network destination "Anywhere";
}

access deny @ac11
{
enabled = TRUE
network source "Anywhere";
network destination "Anywhere";
}
```

You can apply the following new attributes to access-control rules.

Attribute	Description
commands	Specifies that the user can use only the commands listed. Recognized commands are ″connect″, ″bind″, ″udp″, ″ping″, or ″traceroute.″ The commands correspond to the SOCKS commands for proxying different types of traffic.
network destination name	Specifies that the user must be attempting to reach the network name for the rule to apply.

Attribute	Description
network group destination name	Specifies that the user must be attempting to reach any of the networks in name for the rule to apply.
source services	Specifies that users must be attempting to reach any of the listed ports for the rule to apply. You can list either single services or ranges of services.

Proxy Chaining

Proxy-chaining entries describe the addresses of SOCKS proxy servers. These lines tell the server how to contact a given host.

To specify proxy-chaining, first we need to define the server that will be chained to the socks server.

```
server @my-server
{
    hostname = "server.proxy.ibm.com";
    port = 1080;
    version = 5;
   }
```

If the socks server in server.proxy.ibm.com listens to a different port, then that port must be specified using the ″port″ key. The ″version″ key specifies the Socks version handled by that server. Then we define the proxy:

```
proxy @my-proxy
{
    enabled = TRUE;
    noproxy = FALSE;
    server @my-server;
}
```

Make sure to define the server first before the proxy. Finally, the proxy rule must be included in the policy section:

```
policy @my-policy
{
    .
    .
    .

   proxy @my-proxy;
    .
    .
    .
}
```

Installation

An `s5.conf` configuration file must have an installation object.

The following table describes the attributes of the installation object.

Attribute	Description
port	Specifies the port number that the server should listen on for incoming connections.

Attribute	Description
identd	Specifies whether to use the IDENTD protocol when using NULL authentication.
reversedns	Specifies whether to attempt reverse DNS. This is a legacy option. The server does reverse DNS only when necessary (e.g., when a rule needs to check it against a domain-based network, etc.)
udprestrict	Specifies whether the server should accept UDP traffic from anyone, or only from machines that it has previously talked to.
udpclientsport	Specifies whether the server should try to use the same port number on its external interface that the client has used internally. This can improve the performance of some UDP applications.
udpbind	This attribute is no longer used.
timeout	Specifies how long idle connections are allowed to stay active. This attribute is used in conjunction with the timeunit attribute (below).
timeunit	Used in conjunction with the timeout attribute (above) to specify how long idle connections are allowed to stay active.
secout	Specifies where to log security warnings to. SYSTEM refers to the system logger (EventViewer under Windows NT). LOGFILE refers to the security log file under logroot. LOGTOOL refers to the Logging Utility application under Windows NT. For more information, see ″Logging″.
sysout	Specifies where to log security warnings to. SYSTEM refers to the system logger (EventViewer under Windows NT). LOGFILE refers to the security log file under logroot. LOGTOOL refers to the Logging Utility application under Windows NT. For more information, see ″Logging″.
miscout	Specifies where to log security warnings to. SYSTEM refers to the system logger (EventViewer under Windows NT). LOGFILE refers to the security log file under logroot. LOGTOOL refers to the Logging Utility application under Windows NT. For more information, see ″Logging″.
seclevel	Specifies the error level for logging security messages. For more information, refer to ″Logging″.
syslevel	Specifies the error level for logging system messages. For more information, refer to ″Logging″.
misclevel	Specifies the error level for logging miscellaneous messages. For more information, refer to ″Logging″.

Attribute	Description
logroot	Specifies the directory that will contain the log files. If log root is not assigned, default is <prefix>/log.
auditlog	Specifies whether to keep an audit log of all connections processed by the server.
auditpath	Specifies the directory that will contain the audit files. Three files are created in this directory: • accounting: contains the main audit trail • security: contains additional security information • errors: contains information about failed connections (due to network errors, etc.)
auditformat	Specifies which format to log the auditing information in. Currently supported formats are the Web Trends Enhanced Log Format (WELF). which is easily imported into spreadsheets or databases.
buffersize	Specifies how much data to attempt to read from the network at one time. Larger sizes may improve throughput, but will increase memory usage.
maxchildren	Maximum number of connections to allow at any one time. The license should do this automatically.
servicesnames	Specifies whether to look up service names to use in logging messages and audit files.
backlog	Specifies how many pending connections to allow to ″stack up″. The default value is ″5″. On some versions of UNIX, the TCP/IP stack ignores this value. Once the maximum allowable number of connections is in the queue, the server will reject new connections.
pidfile	(UNIX only) Specifies whether to store the process ID. This file is used by the stopsocks script. You usually do not need to specify this attribute.
ipspoofing	Specifies whether to watch for IP spoofing attacks, and reject potentially bad connections. If this option is activated (TRUE), the server will reject any connection that originates from a network interface that it would not use in talking to that host. In complicated network setups, this can cause problems, and should probably not be activated (set to FALSE).
traceroute program	Specifies which program to execute when a ″traceroute″ command is proxied. This should be the executable name by itself, or a fully qualified pathname to the executable (if it is not in the default path for the user the server is running as)

Attribute	Description
pingprogram	Specifies which program to execute when a ″ping″ command is proxied. This should be the executable name by itself, or a fully qualified pathname to the executable (if it is not in the default path for the user the server is running as)
nlsdirectory	Specifies where to find the NLS catalogs for the server. In most cases, this attribute should not be set. The server will automatically determine where the catalogs are installed. Only en_US is supported for this release.
module module_name	Use the module **module_name** in this installation. This means that the module will be loaded and available for use in any rules in the Policy section.

Policy

The policy object is where you arrange all of the rules and give them a specific ordering. The ordering of similar attributes is important, and can significantly affect the policy enforced by the server. Be sure to order or reorder rules carefully.

The following table describes the additional attributes that are valid in a policy object.

Attribute	Description
interface string	Imports the routing rule named ″string″ into the current policy.
authentication string	Imports the authentication rule named ″string″ into the current policy.
proxy string	Imports the proxy chaining rule named ″string″ into the current policy.
filter string	Imports the filter rule named ″string″ into the current policy..
access string	Imports the access-control rule named ″string″ into the current policy.

An example of a policy object is:

```
policy "Converted"
{
     interface @route0;
     authentication @auth0;
     proxy @proxy0;
     proxy @proxy1;
     filter @filter0;
     access @ac10;
     access @ac12;
}
```

Logging

Logs are written to the IBM SecureWay Firewall log file. In addition, special log files can be created for troubleshooting. The following is a discussion of these special log files.

Logging options include three logging methods, eight levels of information, four output options, and two output formats.

Log Methods

There are three log methods: Security, System, and Miscellaneous. When logging server activity, select one of the three methods.

- *Security*: Security information consists of failed authentication attempts and methods. When logging to LOGFILE, the filename is ″security.log″.
- *System*: System information identifies and displays network problems as they affect the IBM Firewall. Examples of network problems include low memory, timing out, a SOCKS server crash, etc. When logging to LOGFILE, the filename is ″system.log″.
- *Miscellaneous*: Miscellaneous information consists of everything else not included in the Security and System methods. When logging to LOGFILE, the filename is ″misc.log″.

Log Levels

There are eight log levels: Fatal, Error, Warning, Information, Verbose, Debug1, Debug2, and Debug3. When logging server activity, select one of the eight methods.

Log Level	Description
Fatal	Fatal error information only.
Error	Critical error information only.
Warning	Non-critical warning information.
Information	Detailed logging information.
Verbose	More detailed logging information than the Information level, but not as detailed as the Debug-level information.
Debug 1, Debug 2, Debug 3	Debugging levels of increasing verbosity. This can cause large amounts of data to be written, and should be used only when troubleshooting.

Log Output Options

There are three log-output options: SYSTEM, LOGTOOL, and LOGFILE. You can specify multiple output options at once.

- *SYSTEM*: Selecting this log-output option will cause logging information to output to the systemlogger. Under UNIX, the system logger is syslog, and under Windows NT, it is the Event Viewer Application Log. Under Windows NT, the server will always log startup information to the Event Viewer.
- *LOGTOOL*: This option is currently valid only under Windows NT. The Logging Tool is the dynamic logging tool. The Logging Tool can dynamically filter out

certain types of log messages and is useful for debugging quickly without having to bring the server up and down to change log levels.

- *LOGFILE*: Selecting this log-output option will cause logging information to log to the appropriate flat file in the logroot directory, as specified in the Installation object. The default logroot directory is `/etc/security/socks/`.

Example of s5.conf configuration file

Finally, we give a simple example of a written configuration for the ABC Company. First, the module section specifies that we will be using an authentication method provided by IBM. This method is called ″ibmpwd″ and it is implemented by the ibm_gwauthp.mod module located in /usr/lib. The installation section describes all the parameters and their corresponding values.

```
###
# Filename: s5.conf
#
# Description: An example of an IBM Secureway Firewall Version 4.1.0
#              Socks Configuration File
#
###


module "server_password_IBM"
{
        comment = "Authenticates based on IBM Firewall password";
        filename = "/usr/lib/ibm_gwauthp.mod";
        stub = "server_password_IBM";
}



installation "ABC"
{
comment = "This is a socks installation for ABC Company";
port = 1080;
version = 5;
reversedns = FALSE;
udprestrict = TRUE;
udpbind = FALSE;
udpclientsport = TRUE;
timeout = 15;
timeunit = MINUTE;
backlog = 20;
maxchildren = 0;
buffersize = 4096;
ipspoofing = TRUE;
servicenames = TRUE;
alertfrequency = 0;
alertthreshold = 0;
traceprogram = "tracert";
pingprogram = "ping";
seclevel = FATAL;
syslevel = FATAL;
misclevel = FATAL;
auditlog = FALSE;
}

network host "Anywhere"
{
comment = "Anywhere";
ipaddress = "0.0.0.0";
}
```

```
network host "9.37.58.54/255.255.240.0"
{
comment = "Anywhere";
ipaddress = "9.37.58.54";
}

network subnet "9.67.143.161/255.255.255.240"
{
comment = "9.67.143.161/255.255.255.240";
ipaddress = "9.67.143.161";
netmask = "255.255.255.240";
}

network subnet "9.67.132.252/255.255.248.0"
{
comment = "9.67.132.252/255.255.248.0";
ipaddress = "9.67.132.252";
netmask = "255.255.248.0";
}

network subnet "9.37.56.224/255.255.240.0"
{
comment = "9.67.132.252/255.255.248.0";
ipaddress = "9.37.56.224";
netmask = "255.255.240.0";
}

interface @route0
{
enabled = TRUE;
network source "9.37.58.54/255.255.240.0";
card = "9.37.58.54";
}

authentication @auth0
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
methods = "Null";
}

authentication @auth1
{
enabled = TRUE;
network source "Anywhere";
methods = "ibmpwd";
}

access permit @acl1
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 20;
}

access permit @acl2
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 1024-65535;
}

access permit @acl3
{
enabled = TRUE;
```

```
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 70;
}

access permit @acl4
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 80;
}

access permit @acl5
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 443;
}

access permit @acl6
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 23;
}

access permit @acl7
{
enabled = TRUE;
network source "9.67.143.161/255.255.255.240";
network destination "Anywhere";
destination services = 210;
}

access deny @acl8
{
enabled = TRUE;
network source "Anywhere";
network destination "Anywhere";
}

server "socks.eternity.ibm.com"
{
        hostname = "socks.eternity.ibm.com";
        port = 1080;
        version =5;
}

proxy @proxy1
{
      enabled = TRUE;
      noproxy = false;
      server  "socks.eternity.ibm.com";
}

policy "ABCPolicy"
{
interface @route0;
authentication @auth0;
authentication @auth1;
access @acl1;
access @acl2;
access @acl3;
access @acl4;
```

```
access @acl5;
access @acl6;
access @acl7;
access @acl8;
proxy  @proxy1;
}
```

The succeeding definitions enumerate the network objects - hosts and subnets, and routes. The authentication rules require authentication for all users originating from all hosts using ″ibmpwd″ except for hosts in the subnet ″9.67.143.161/255.255.255.240″. The succeeding sections define the access rules. For example, we allow a telnet request from any host in the ″9.67.143.161/255.255.255.240″ subnet to any other hosts, hence, ″Anywhere″. In the policy section, we specify which of these rules are going to be used.

Note: The order of evaluating these rules will be based on the order they were given in the policy section. It is therefore logical that rule @acl8 must be the last in the list.

The example also shows that a proxy located in host socks.eternity.ibm.com is going to be chained with our Socks server.

Appendix E. The Crontab Command

The crontab command submits, edits, lists, or removes cron jobs. A cron job is a command run by the cron daemon at regularly scheduled intervals.

crontab syntax

```
crontab [-e | -l | -r | -v | File ]
```

–e Edits a copy of your crontab file or starts an editing session if you do not already have a crontab file. Each entry must be in a form acceptable to the cron daemon. When editing is complete, the entry is installed as your crontab file. The editing session is started using the editor specified by the EDITOR environment variable.

The default editor is vi.

–l Lists the contents of your crontab file.

–r Removes an existing crontab file from the crontab directory.

–v Lists the status of your cron jobs.

File Allows you to create your own crontab files.

When you finish creating entries and exit the file, the crontab command copies the file into the **/var/spool/cron/crontabs** directory and names it with your current username. If a file with your name already exists in the crontabs directory, the crontab command overwrites the existing name.

Alternatively, you can create a crontab file by specifying the File parameter. If the file already exists, it must be in the format the cron daemon expects. If the file does not exist, the crontab command invokes the editor. If the EDITOR environment variable exists, the command invokes the editor it specifies. Otherwise, the crontab command uses the vi editor.

The cron daemon runs commands according to the crontab file entries. Unless you redirect the output of a cron job to standard output or error, the cron daemon mails you any command output or error. If you specify a cron job incorrectly in your crontab file, the cron daemon does not run the job.

The cron daemon examines crontab files only when the cron daemon is initialized. When you make changes to your crontab file using the crontab command, a message indicating the change is sent to the cron daemon. This eliminates the overhead of checking for new or changed files at regularly scheduled intervals.

The **/var/adm/cron/cron.allow** and **/var/adm/cron/cron.deny** files control which users can use the crontab command. A root user can create, edit, or delete these files. Entries in these files are user login names with one name to a line. If your login ID is associated with more than one login name, the crontab command uses the first login name that is in the **/etc/passwd** file, regardless of which login name you might actually be using.

Here is a quick method for setting up a crontab. To learn more about the AIX crontab function, issue "**man crontab**" from the AIX command line.

To set up a crontab that will compress and archive all log files (that have been configured to be archived) every Sunday at 2am, follow these steps:

1. Start an editor session on the crontab file by issuing the **crontab –e** command.

   Note: This should bring up an editor session using the editor defined by your $EDITOR variable. If you wish to use another editor, you can either change the value of the $EDITOR variable or issue ″crontab –1>tempcron″. You can then edit the tempcron file and issue ″crontab tempcron″ to activate your changes to the file.

2. Each crontab file entry contains six fields separated by spaces or tabs in the following form:

   ```
   minute hour day_of_month month weekday
   ```

   These fields accept the following values:

   minute:
   0 through 59

   hour: 0 through 23

   day_of_month:
   1 through 31

   month:
   1 through 12

   weekday:
   0 through 6 for Sunday through Saturday

   To run the **fwlogmgmt** command every Sunday at 2 am, add the following line to the bottom of the crontab file:

   ```
   0 2 * * 0 /usr/bin/fwlogmgmt -1
   ```

   Your crontab file should look something like:

   ```
   ------------------------------------------------------
   #(c) COPYRIGHT International Business Machines Corp. 1989,1994
   #All Rights Reserved
   #Licensed materials - Property of IBM
   #
   #US Government Users Restricted Rights - Use, duplication or
   #disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
   #
   #0 3 * * * /usr/sbin/skulker
   #45 2 * * 0 /usr/lib/spell/compress
   #45 23 * * * ulimit 5000; /usr/lib/smdemon.cleanu > /dev/null
   0 11 * * * /usr/bin/errclear -d S,0 30
   0 12 * * * /usr/bin/errclear -d H 90
   0 2 * * 0 /usr/bin/fwlogmgmt -1
   ------------------------------------------------------,
   ```

3. Save the file to activate the changes.

Appendix F. Obtaining Requests for Comments (RFCs)

Requests for comments (RFCs) are documents that present new protocols and establish standards for the Internet protocol suite. Hardcopies of all RFCs are available from the Network Information Center (NIC), either individually or on a subscription basis. You can obtain these documents from:

Government Systems, Inc.
Attn: Network Information Center
14200 Park Meadow Drive
Suite 200
Chantilly, VA 22021

You can access RFCs from this URL:

http://www.ietf.org/html.charters/ipsec-charter.html.

Online copies are available from the NIC using FTP to connect to `ds.internic.net`. You can transfer the files using the following format:

```
RFC:RFCnnnn.TXT
RFC:RFCnnnn.PS
```

Where:

nnnn Is the RFC number

TXT Is the text format

PS Is the PostScript format

The format for the RFC index is:

```
RFC:RFC-INDEX.TXT
```

Note: Many RFCs are only available in text format. Before requesting a PostScript file, first check the RFC Index to make sure the RFC is available in that format. You can also request online copies of the RFCs through the electronic mail, from the automated NIC mail server, by sending a message to `mailserv@ds.internic.net`. You must include one of the following commands in body of your note:

```
SEND RFCnnnn.TXT
or
SEND RFCnnnn.PS
```

Where:

nnnn Is the RFC number

TXT Is the text format

PS Is the PostScript format

For example, to request the text format of RFC 812, you would specify in the body of your note:

```
SEND RFC812.TXT
```

To request an online copy of the RFC index, include the following command in the body of your note:

```
SEND RFC-INDEX.TXT
```

IPSec RFCs

Our IPSec implementation complies with RFC 2401: *Security Architecture for the Internet Protocol*.

For details of IPSec security protocols and algorithms, please consult the following RFCs:

- RFC 2402: IP Authentication header
- RFC 2403: The use of HMAC-MD5–96 within ESP and AH
- RFC 2404: The use of HMAC-SHA-1–96 within ESP and AH
- RFC 2405: The ESP DES-CBC Cipher Algorithm with Explicit IV
- RFC 2406: IP Encapsulating Security Payload (ESP)

Bibliography

For additional information about security on the Internet, visit the IBM Firewall home page at **http://www.ibm.com/software/security/firewall**.

Information in IBM Publications

Other IBM sources of information on firewalls, Internet security, and general security topics are listed here.

Firewall Topics

The following documents are available on the IBM SecureWay Firewall CD-ROM and the IBM SecureWay Firewall home page.

- *IBM SecureWay Firewall User's Guide*, GC31-8419
- *IBM SecureWay Firewall Reference*, SC31-8418

Internet and World Wide Web Topics

- *A Comprehensive Guide to Virtual Private Networks, Volume 1: IBM Firewall, Server and Client Solutions*, SG24-5201
- *A Guide to the Internet Connection Servers*, SG24-4805
- *Accessing CICS Business Applications from the World Wide Web*, SG24-4547
- *Accessing OS/390 OpenEdition MVS from the Internet*, SG24-4721
- *Accessing the Internet*, SG24-2597
- *Building the Infrastructure for the Internet*, SG24-4824
- *Cool Title about the AS/400 and Internet*, SG24-4815
- *The Domino Defense: Security in Lotus Notes and the Internet*, SG24-4848
- *Examples of Using MQSeries on WWW*, SG24-4882
- *How to Secure the Internet Connection Server for MVS/ESA*, SG24-4803
- *Lotus Domino Server Release 4.5 on AIX Systems: Installation, Customization, and Administration*, SG24-4694
- *Netscape Proxy Server*, SK2T-7444
- *Running CICS Transactions through the Web: The CICS Internet Gateway to VSE/ESA*, SG24-4799
- *Safe Surfing: How to Build a Secure World Wide Web Connection*, SG24-4564
- *Teach Yourself CGI Programming with PERL in a Week*, SR23-7343
- *Using the Information Super Highway*, GG24-2499
- *World Wide Web Access to DB2*, SG24-4716

General Security Topics

- *The Basics of IP Network Design*, SG24-2580
- *Elements of Security: AIX V4.1*, GG24-4433
- *Enterprise-Wide Security Architecture and Solutions Presentation Guide*, SG24-4579
- *HACMP/6000 Customization Examples*, SG24-4498
- *IBM Global Network (IGN) Security Policy*, GC34-2206
- *IBM Security Architecture: Securing the Open Client/Server Distributed Enterprise*, SC24-8135
- *IBM Systems Monitor: Anatomy of a Smart Agent*, SG24-4398
- *Security Overview of Open Systems Networking*, GG24-3815
- *Systems Monitor for AIX User's Guide*, SC31-8173
- *TCP/IP Tutorial and Technical Overview*, GG24-3376

Information in Industry Publications

These industry publications pertain to sendmail, TCP/IP and UNIX:

- Albitz, Paul, and Cricket Liu. *DNS and BIND*. Sebastopol, CA: O'Reilly and Associates, 1997. (ISBN: 1-56592-236-0)
- Costales, Brian with Eric Allman. *Sendmail* O'Reilly and Associates, Inc. (ISBN: 1-56592-222-0)
- Hunt, Craig. *TCP/IP Network Administration* O'Reilly and Associates, Inc. (ISBN: 0-937175-82-X)
- Nemeth, Snyder, et al. *UNIX System Administration Handbook* Prentice Hall. (ISBN: 0-13-151051-7

This industry publication pertains to Windows NT:

Cowart, Robert. *Windows NT Server 4.0 Administrator's Bible*. IDG Books Worldwide, 1996. (ISBN: 0764580094)

These industry publications pertain to firewalls and security on the Internet:

- Ahuja, Vijay. *Network and Internet Security*. Boston: Academic Press Professional, 1996. (ISBN: 0120455951)
- Ahuja, Vijay. *Secure Commerce on the Internet*. Boston: Academic Press Professional, 1997. (ISBN: 0120455978)
- Anderson, Bart, et al. *The Waite Group's UNIX Communications and the Internet*. Indianapolis, IN: Sams Pub., 1995. (ISBN: 0672305372)
- Atkins, Derek, et al. *Internet Security: Professional Reference*. Indianapolis, IN: New Riders Publishing, 1996. (ISBN: 1562055577)
- Chapman, D. Brent, and Elizabeth D. Zwicky. *Building Internet Firewalls*. Sebastopol, CA: O'Reilly and Associates, 1995. (ISBN: 1565921240)
- Cheswick, Willam R., and Steven M. Bellovin. *Firewalls and Internet Security*. New York: Addison-Wesley, 1994. (ISBN: 0201633574)
- Cooper, Frederic J., et al. *Implementing Internet Security*. Indianapolis, IN: New Riders Publishing, 1995. (ISBN: 1562054716)
- Curry, David. *UNIX System Security: Guide for Users and Systems Administrators*. Sebastopol, CA: O'Reilly and Associates, 1994. (ISBN: 0201563274)
- Garfinkel, Simson, and Gene Spafford. *Practical UNIX Security*. Sebastopol, CA: O'Reilly and Associates, 1991. (ISBN: 0937175722)
- Garfinkel, Simson, and Gene Spafford. *Practical UNIX and Internet Security*. Sebastopol, CA: O'Reilly and Associates, 1996. (ISBN: 1565921488)
- Hare, Chris, and Karanjit Siyan. *Internet Firewalls and Network Security*. Indianapolis, IN: New Riders Publishing, 1996. (ISBN: 1562056328)
- Randall, Neil. *Teach Yourself the Internet in a Week*. Indianapolis, IN: Sams.Net, 1995. (ISBN: 0672307359)
- Stallings, William. *Internet Security Handbook*. Foster City, CA: IDG Books, 1995. (ISBN: 0077092546)
- Stevens, W. Richard. *TCP/IP Illustrated*. Reading, MA: Addison-Wesley, 1994. (ISBN: 0201634953)

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