

ASUSTek Server Management

Installation Procedures for Broadcom ASF Solution

Revision 0.05

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ASUSTek Confidential



Revision History

Revision	Date	Author	Reason For Change
0.01	07/26/2004	East Zhao	First Beta Version
0.02	10/01/2004	East Zhao	Add batch file function to configure ASF
0.03	10/06/2004	JinCheng	Update the client environment setup
0.04	12/03/2004	JinCheng	Add end user tool table
0.05	02/02/2005	JinCheng	Add Windows ASF configuration section

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Chapter 1 - Environment Setup

1.1 Enable BroadCom 57xx ASF function (DOS or Windows 95/98)

Table 1.1.1 (b57diag.exe)

Broad Com LAN Configuration (b57diag.exe)		
Step	Function	Command
1	Enter BroadCom Engineer Mode	b57diag -b57eng
2	Change LAN chip if necessary	dev 0 or dev 1
3	Update BootCode firmware	seprg <i>FirmwareFile</i> (Ex: ee5721c3.29a)
4	Enable WOL	setwol -e
5	Update ASF/IPMI firmware	seprg -a <i>FirmwareFile</i> (Ex: a25721c6.23)
6	Configure ASF	asfcfg (refer to Figure 1.1.1)
	Configure ASF Settings	select 1 (ASF Settings, refer to Figure 1.1.2) 3=1 (Enable PET Heartbeats) 6=10.10.10.x (Set Client IP) 7=10.10.10.y (Set Remote Console IP) 8=10.10.10.254 (Set Gateway) 9=255.255.255.0 (Set Subnet mask)
	Configure ASF Remote Control Data	select 4 (refer to Figure 1.1.3)
	Configure ASF Capabilities Supported	select 5 (refer to Figure 1.1.4)
	Configure ASF 2.0 (Secure RMCP)	select 7 (refer to Figure 1.1.5)
		select 9 (save and exit)
7	Enable ASF	setasf -e
8	Quit	q
Aux-1	Use batch file to update asf firmware	b57diag -c 0 -e b57kia -pasf <i>FirmwareFile</i>
Aux-2	Save ASF Configuration data	b57diag -b57eng asfcfg select 0 enter <i>filename</i> (Ex: asfcfg.dat)
Aux-3	Restore ASF configuration data	b57diag -b57eng asfcfg <i>filename</i> (Ex: asfcfg.dat) select 9 (save and exit)
Aux-4	Use batch file to restore asf Configuration data	b57diag -do <i>asf.s</i>
	Note: ASF function	Example for <i>asf.s</i> : asfcfg <i>asfcfg.dat</i> setwol -e setasf -e exit

Table 1.1.2 (b57udiag.exe)

Broad Com end user LAN Configuration (b57udiag.exe)		
Step	Function	Command
1	Show all the LAN information on board	b57udiag -ver
2	Update BootCode firmware	b57udiag -c 0 -firm <i>FirmwareFile</i>
3	Enable WOL	b57udiag -c 0 -w 1
4	Update ASF firmware	b57udiag -c 0 -pipmi <i>FirmwareFile</i>
5	Enable ASF	b57udiag -c 0 -asf 1

Table 1.1.3 Function table(b57diag.exe & b57udiag.exe)

Broad Com LAN Configuration Function Table				
#	Function		b57diag.exe	b57udiag.exe
1	MAC	Get	b57diag -ver	b57udiag -ver
		Set	b57diag -c 0 -e b57kia -mac <i>MacNo</i> -t abcd	N/A
2	BootCode Firmware	Get version info	b57diag -ver	b57udiag -ver
		Update	b57diag -c 0 -firm <i>FirmwareFile</i>	b57udiag -c 0 -firm <i>FirmwareFile</i>
3	WOL	Disable	b57diag -c 0 -w 0	b57udiag -c 0 -w 0
		Enable	b57diag -c 0 -w 1	b57udiag -c 0 -w 1
4	ASF Firmware	Get version info	b57diag -b57eng dev 0 or dev 1 dir q	b57udiag -cmd device 0 or device 1 dir exit
		Update	b57diag -c 0 -e b57kia -pasf <i>FirmwareFile</i> -t abcd	b57udiag -c 0 -pipmi <i>FirmwareFile</i>
5	ASF configure	Manual mode	b57diag -b57eng asfcfg (ref. Table 1.1 step 9)	N/A
		Batch run mode	b57diag -do asf.s (ref. Table 1.1 step Aux-3 or Aux-4)	N/A
6	ASF	Disable	b57diag -c 0 -asf 0	b57udiag -c 0 -asf 0
		Enable	b57diag -c 0 -asf 1	b57udiag -c 0 -asf 1

Figure 1.1.1 asfcfg

```
Broadcom NetXtreme Engineering Diagnostics 7.30 (5/11/04)
*****

C Brd:Rv   Bus   PCI Spd Base Irq EEP   MAC           Fmw           Configuration
-----
0 5721:A1 02:00:0 E 2 500 FAFE 5 128k 00E018000046 5721-v3.23a WA,auto
1 5705:A3 04:04:0 32 33 FAFE 9 32k 00E018000047 5705-v3.18 W,auto
0:>asfcfg
loading data from NVRAM

0. Save to file
1. ASF Settings
2. ASF Alert Info
3. ASF Alert Data for Legacy Sensors
4. ASF Remote Control Data
5. ASF Capabilities Supported
6. ASF SMBus Addresses
7. ASF 2.0 (Secure RMCP)
8. SMBus Init Data
9. Save and Exit
10. Exit without Saving

Enter your choice -> 1_
```

Figure 1.1.2 ASF Settings

```
Enter your choice -> 1

0. Return to previous menu
1. Receive RMCP Packets.....: Enabled
2. Transmit PET Packets.....: Enabled
3. Transmit PET Heartbeats...: Enabled
4. PET Heartbeat Interval....: 2 seconds
5. PET Retransmit Interval...: 10 seconds
6. NIC (client) IP Address...: 10.10.10.22
7. Management Console Address: 10.10.10.20
8. Gateway IP Address.....: 10.10.10.254
9. Subnet Mask.....: 255.255.255.0
10. Link Speed.....: Speed 10/100 full Auto, Pause Capable
11. UuidGuid.....: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
12. SMBus Legacy Poll Interval: 4 seconds
13. Delay First Legacy poll...: 0 seconds
14. NIC SMBus Address.....: 0xCC
15. WoL on ASF traffic.....: Disabled
16. Scan for ASF devices.....: Disabled
17. SNMP Community Name.....: public

Enter your choice (option=hexnum) -> 3=1
```

Figure 1.1.3 Set ASF Remote Control Data (set four number 1=4, and use 2=0, 1, 2, 3 to set command)

```
Enter your choice -> 4

0. Return to previous menu
1. Number of Controls: 4
2. Edit Each Control (e.g. '2=n', where 'n' is the entry number)

  Entry  Function          DevAddr Command  DataValue
  -----
    0.    00 (Reset      )    88      00      03
    1.    01 (PowerDown )    88      00      02
    2.    02 (PowerUp   )    88      00      01
    3.    03 (PowerReset)    88      00      04

Enter your choice -> _
```

Figure 1.1.4 Set ASF Capabilities supported

```
Enter your choice -> 5

0. Return to previous menu
1. System Capabilities...: 0f
   SecureReset SecurePowerUp SecurePowerDown SecurePowerReset
2. Special Commands.....: 00 00
3. Firmware Capabilities: 00 00 00 0f

Enter your choice (option=hexnum [hexnum...]) -> _
```

Figure 1.1.5 Set ASF 2.0 (Secure RMCP)

```
Enter your choice -> 7

0. Return to previous menu
1. Secure RMCP.....: Enabled
2. ASF 1.0 Compatibility.....: Enabled
3. Generation Key.....: "ASF"
4.                      hex: 415346
5. Operator Auth Key.....: "ASF"
6.                      hex: 415346
7. Administrator Auth Key.....: "ASF"
8.                      hex: 415346
9. Operator Rights.....: 0xf (Reset PowerUp PowerDown PowerReset)
10. Administrator Rights.....: 0xf (Reset PowerUp PowerDown PowerReset)
11. Session Inactivity Timeout.....: 300 (seconds)

Enter your choice (option=hexnum) -> _
```


1.2 Configure BroadCom 57xx ASF function (Windows)

There are 4 or 5 files in the same folder in Windows (IA32/IA64/AMD64) to access the ASF configuration :

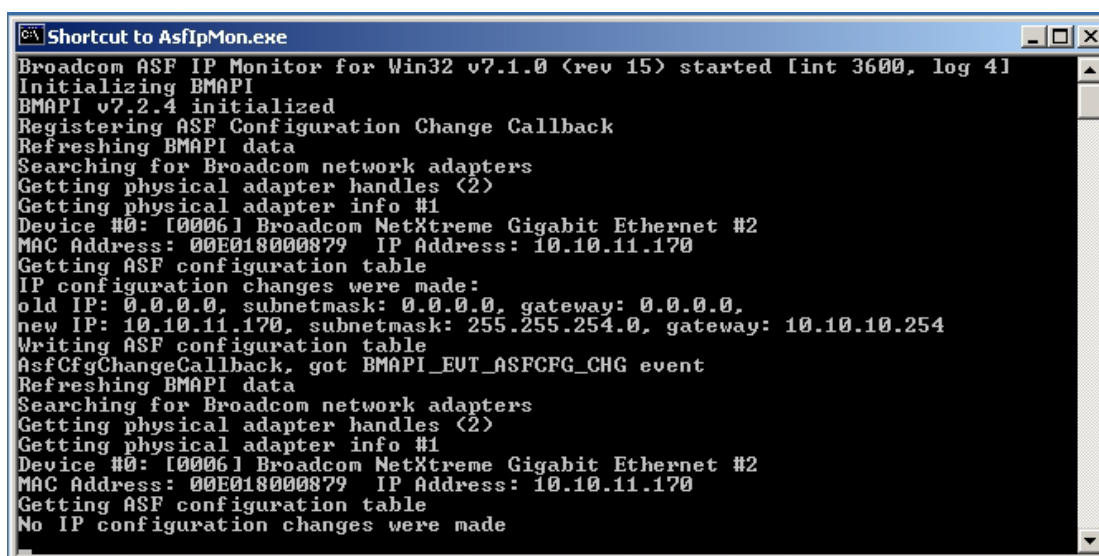
ASFConfig.exe
BASFND.sys
BMAPI.dll (BMAPIa.dll for AMD64)
FADA64.sys (for AMD64 only)
AsfIpMon.exe

Environment : Bring up to Windows with BroadCom LAN configured and “ASF!” table BIOS supported.<refer to Figure 1.2.2 & 1.2.3>

Setup :

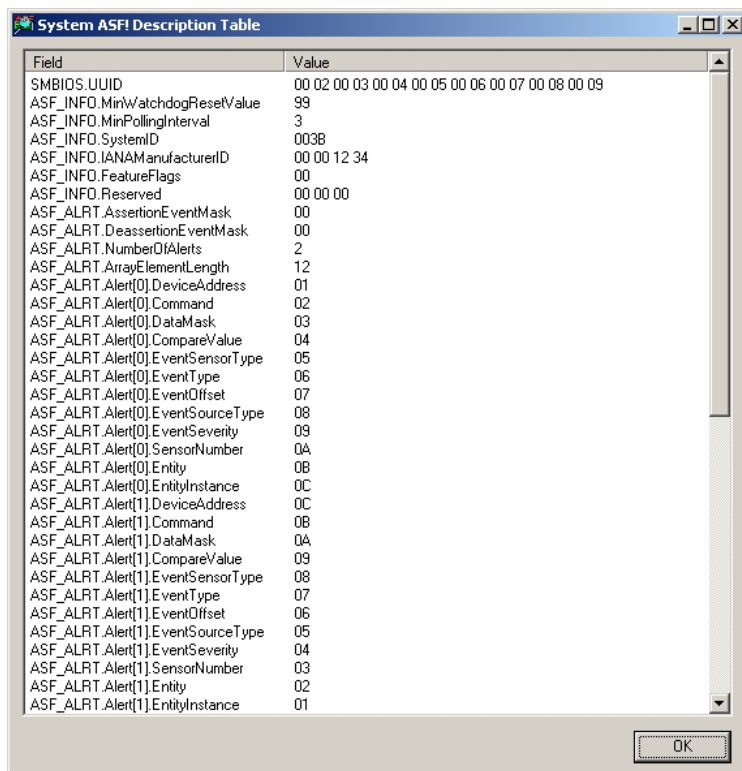
- Step 1 : Put all the 4 or 5 files above in one folder.
- Step 2 : Run the AsfIpMon.exe to (dynamic) update the IP, subnetmask and default gateway address. <refer to Figure 1.2.1>
- Step 3 : Run the ASFConfig.exe and setting up all the necessary data as your working environment. <refer to Figure 1.2.4, 1.2.5 & 1.2.6>
- Step 4 : Restart Windows.

Figure 1.2.1 AsfIpMon.exe



```
Shortcut to AsfIpMon.exe
Broadcom ASF IP Monitor for Win32 v7.1.0 (rev 15) started [int 3600, log 4]
Initializing BMAPI
BMAPI v7.2.4 initialized
Registering ASF Configuration Change Callback
Refreshing BMAPI data
Searching for Broadcom network adapters
Getting physical adapter handles (2)
Getting physical adapter info #1
Device #0: [0006] Broadcom NetXtreme Gigabit Ethernet #2
MAC Address: 00E018000879 IP Address: 10.10.11.170
Getting ASF configuration table
IP configuration changes were made:
old IP: 0.0.0.0, subnetmask: 0.0.0.0, gateway: 0.0.0.0,
new IP: 10.10.11.170, subnetmask: 255.255.254.0, gateway: 10.10.10.254
Writing ASF configuration table
AsfCfgChangeCallback, got BMAPI_EVT_ASFCFG_CHG event
Refreshing BMAPI data
Searching for Broadcom network adapters
Getting physical adapter handles (2)
Getting physical adapter info #1
Device #0: [0006] Broadcom NetXtreme Gigabit Ethernet #2
MAC Address: 00E018000879 IP Address: 10.10.11.170
Getting ASF configuration table
No IP configuration changes were made
```

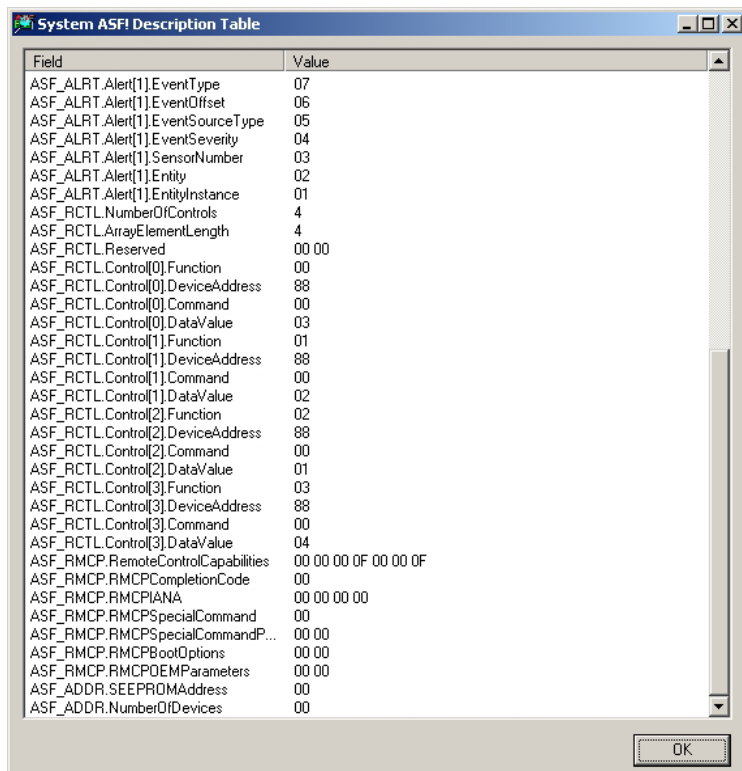
Figure 1.2.2 “ASF!” Table BIOS supported –1 (under ASFConfig.exe)



The screenshot shows a window titled "System ASF! Description Table" with a table of BIOS fields and their values. The table has two columns: "Field" and "Value".

Field	Value
SMBIOS.UUID	00 02 00 03 00 04 00 05 00 06 00 07 00 08 00 09
ASF_INFO.MinWatchdogResetValue	99
ASF_INFO.MinPollingInterval	3
ASF_INFO.SystemID	0038
ASF_INFO.IANAManufacturerID	00 00 12 34
ASF_INFO.FeatureFlags	00
ASF_INFO.Reserved	00 00 00
ASF_ALERT.AssertionEventMask	00
ASF_ALERT.DeassertionEventMask	00
ASF_ALERT.NumberOfAlerts	2
ASF_ALERT.ArrayElementLength	12
ASF_ALERT.Alert[0].DeviceAddress	01
ASF_ALERT.Alert[0].Command	02
ASF_ALERT.Alert[0].DataMask	03
ASF_ALERT.Alert[0].CompareValue	04
ASF_ALERT.Alert[0].EventSensorType	05
ASF_ALERT.Alert[0].EventType	06
ASF_ALERT.Alert[0].EventOffset	07
ASF_ALERT.Alert[0].EventSourceType	08
ASF_ALERT.Alert[0].EventSeverity	09
ASF_ALERT.Alert[0].SensorNumber	0A
ASF_ALERT.Alert[0].Entity	0B
ASF_ALERT.Alert[0].EntityInstance	0C
ASF_ALERT.Alert[1].DeviceAddress	0C
ASF_ALERT.Alert[1].Command	0B
ASF_ALERT.Alert[1].DataMask	0A
ASF_ALERT.Alert[1].CompareValue	09
ASF_ALERT.Alert[1].EventSensorType	08
ASF_ALERT.Alert[1].EventType	07
ASF_ALERT.Alert[1].EventOffset	06
ASF_ALERT.Alert[1].EventSourceType	05
ASF_ALERT.Alert[1].EventSeverity	04
ASF_ALERT.Alert[1].SensorNumber	03
ASF_ALERT.Alert[1].Entity	02
ASF_ALERT.Alert[1].EntityInstance	01

Figure 1.2.3 “ASF!” Table BIOS supported –2 (under ASFConfig.exe)



The screenshot shows a window titled "System ASF! Description Table" with a table of BIOS fields and their values. The table has two columns: "Field" and "Value".

Field	Value
ASF_ALERT.Alert[1].EventType	07
ASF_ALERT.Alert[1].EventOffset	06
ASF_ALERT.Alert[1].EventSourceType	05
ASF_ALERT.Alert[1].EventSeverity	04
ASF_ALERT.Alert[1].SensorNumber	03
ASF_ALERT.Alert[1].Entity	02
ASF_ALERT.Alert[1].EntityInstance	01
ASF_RCTL.NumberOfControls	4
ASF_RCTL.ArrayElementLength	4
ASF_RCTL.Reserved	00 00
ASF_RCTL.Control[0].Function	00
ASF_RCTL.Control[0].DeviceAddress	88
ASF_RCTL.Control[0].Command	00
ASF_RCTL.Control[0].DataValue	03
ASF_RCTL.Control[1].Function	01
ASF_RCTL.Control[1].DeviceAddress	88
ASF_RCTL.Control[1].Command	00
ASF_RCTL.Control[1].DataValue	02
ASF_RCTL.Control[2].Function	02
ASF_RCTL.Control[2].DeviceAddress	88
ASF_RCTL.Control[2].Command	00
ASF_RCTL.Control[2].DataValue	01
ASF_RCTL.Control[3].Function	03
ASF_RCTL.Control[3].DeviceAddress	88
ASF_RCTL.Control[3].Command	00
ASF_RCTL.Control[3].DataValue	04
ASF_RMCP.RemoteControlCapabilities	00 00 00 0F 00 00 0F
ASF_RMCP.RMCPCompletionCode	00
ASF_RMCP.RMCPIANA	00 00 00 00
ASF_RMCP.RMCPSPecialCommand	00
ASF_RMCP.RMCPSPecialCommandP...	00 00
ASF_RMCP.RMCPBootOptions	00 00
ASF_RMCP.RMCP OEMParameters	00 00
ASF_ADDR.SEEPROMAddress	00
ASF_ADDR.NumberOfDevices	00

Figure 1.2.4 ASFConfig.exe - <Settings>

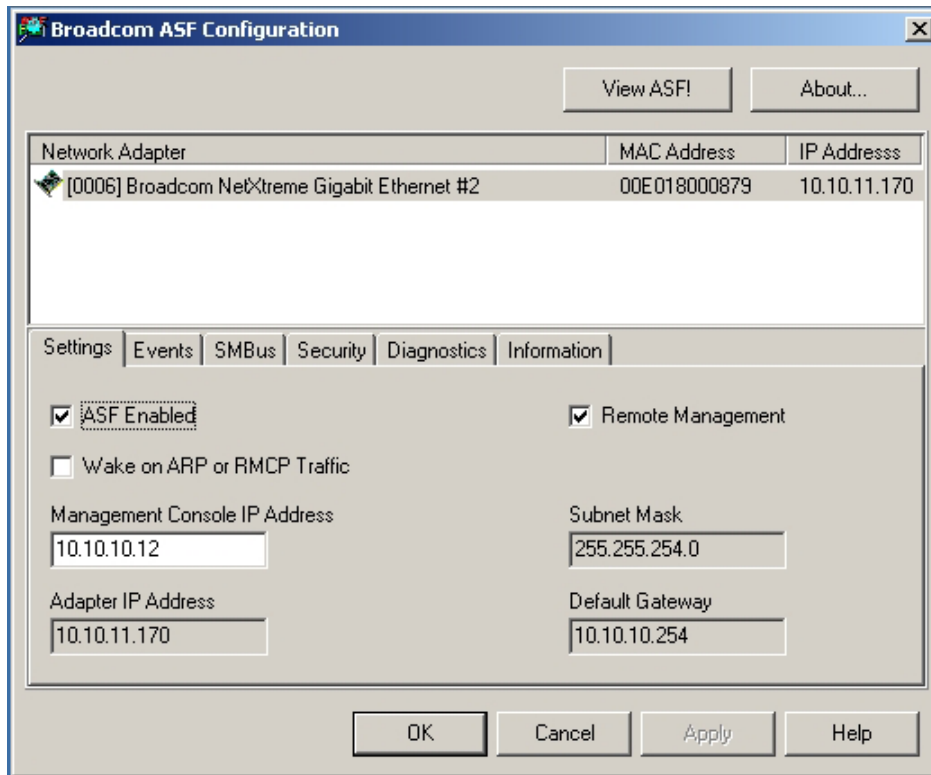


Figure 1.2.5 ASFConfig.exe - <Events>

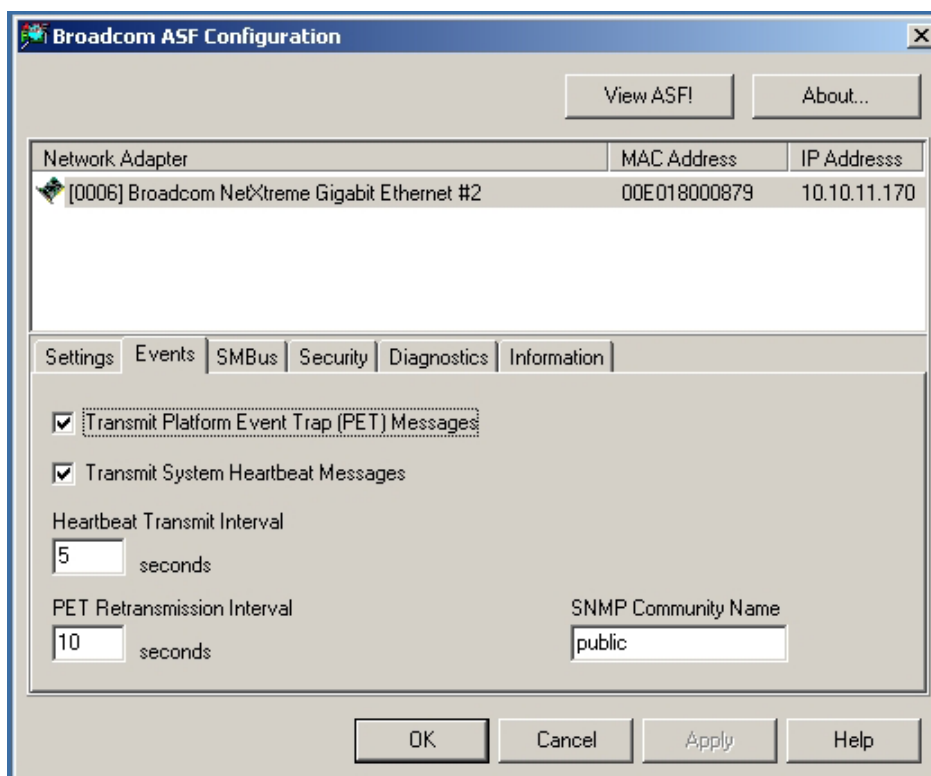
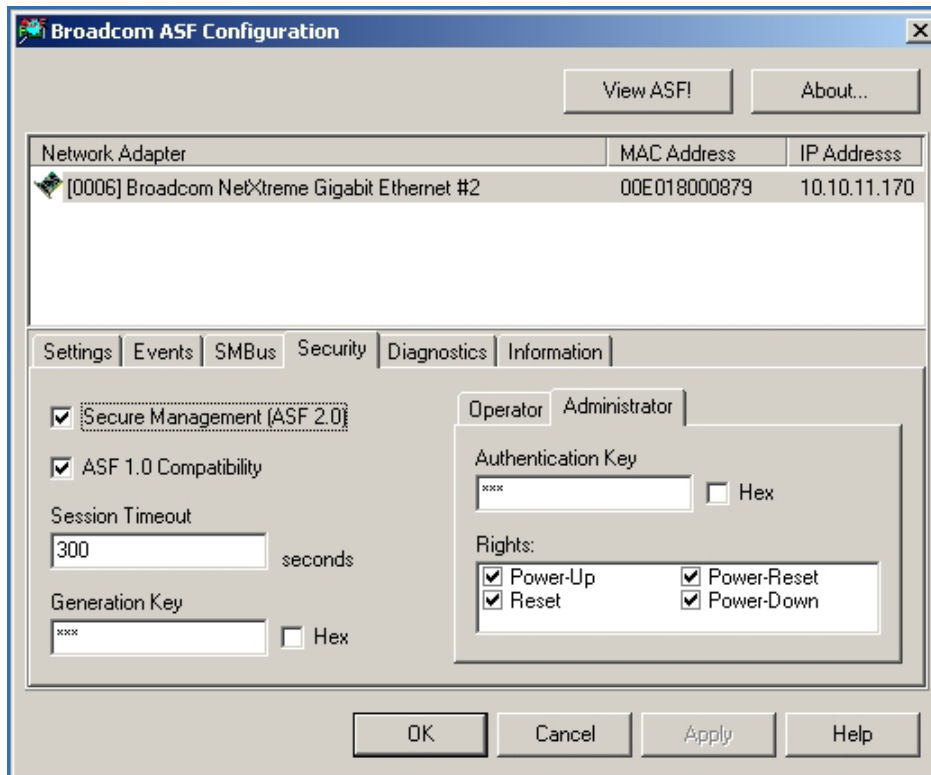


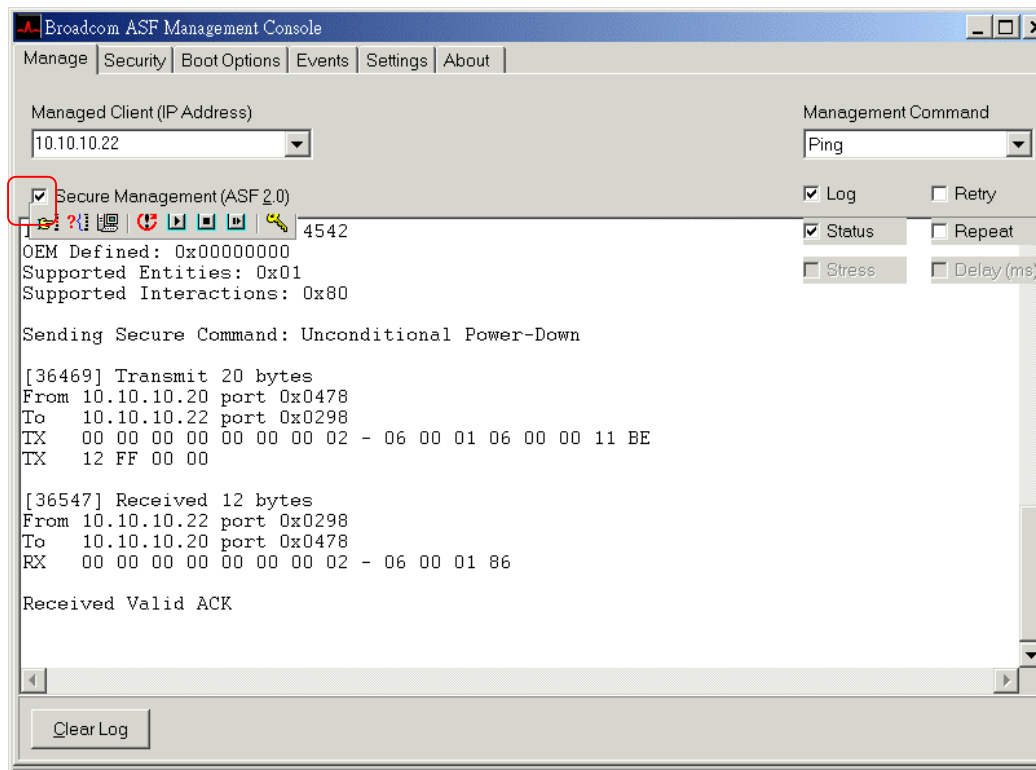
Figure 1.2.6 ASFConfig.exe - <Security>



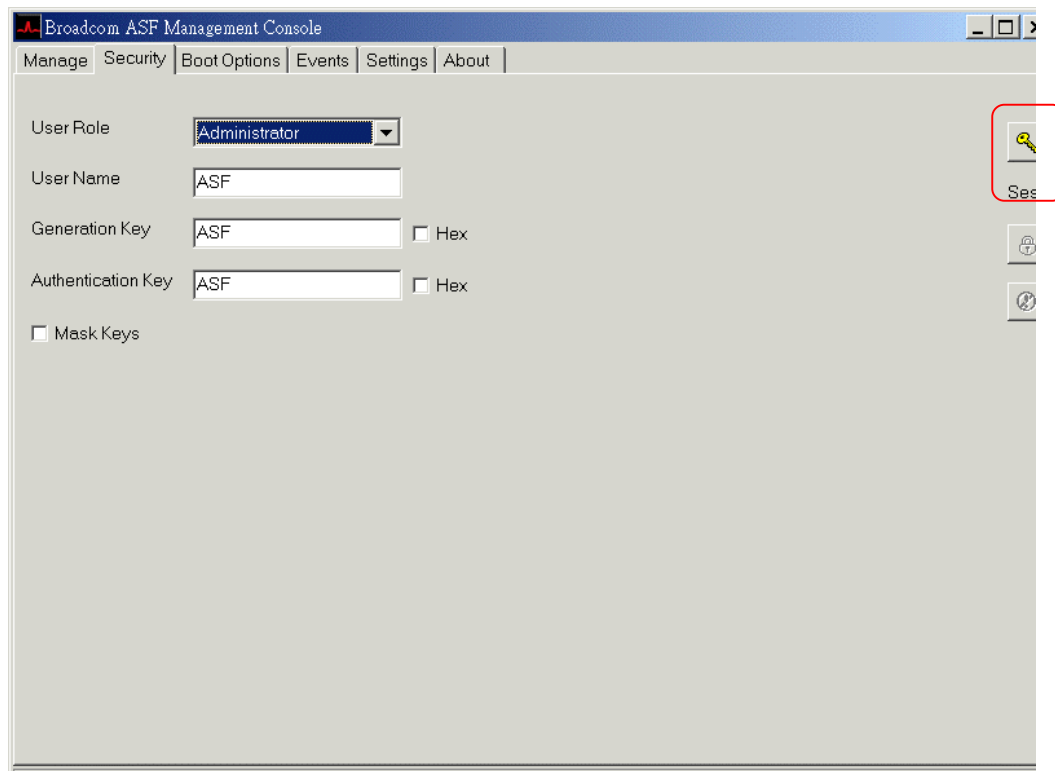
Chapter 2 - Remote Management Console

2.1 Broadcom ASF Console

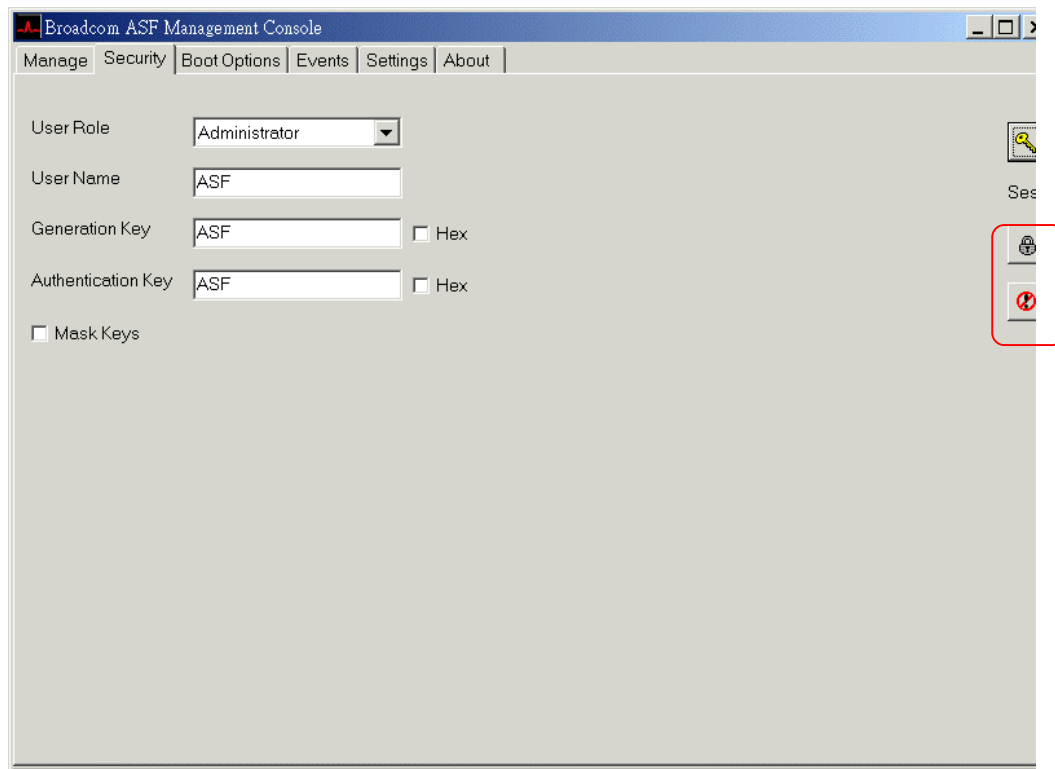
1. Open Broadcom ASF Console, select Secure Management



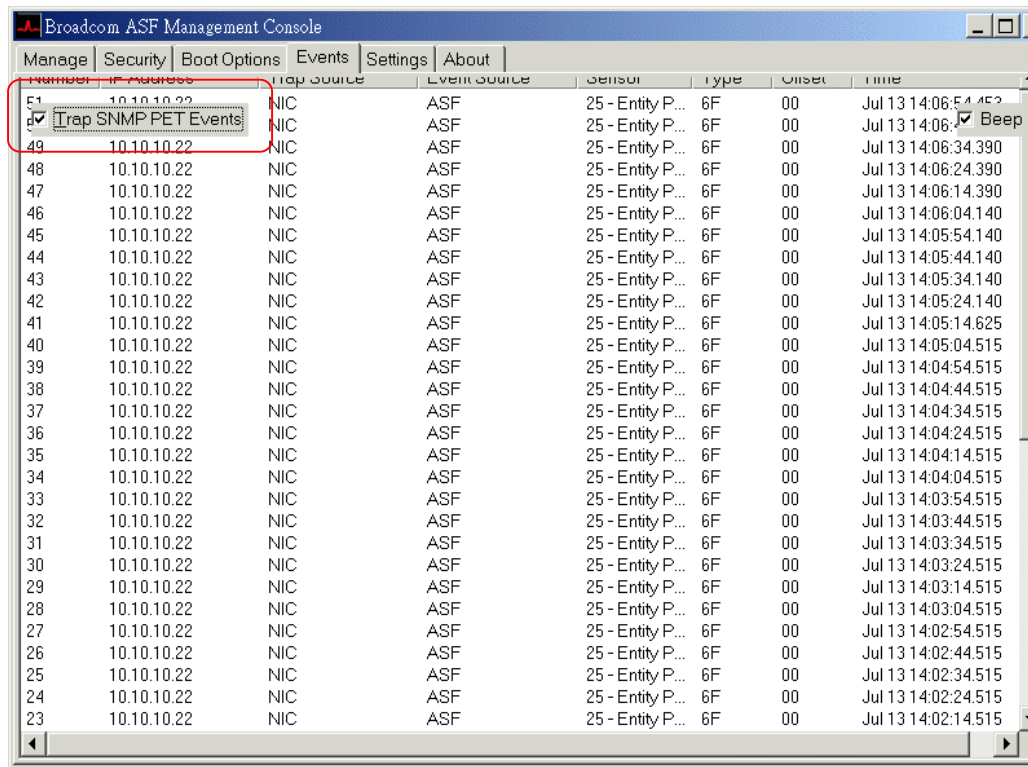
2. Key in User Name, Generation Key, Authentication Key, and open session



3. Open Session Success

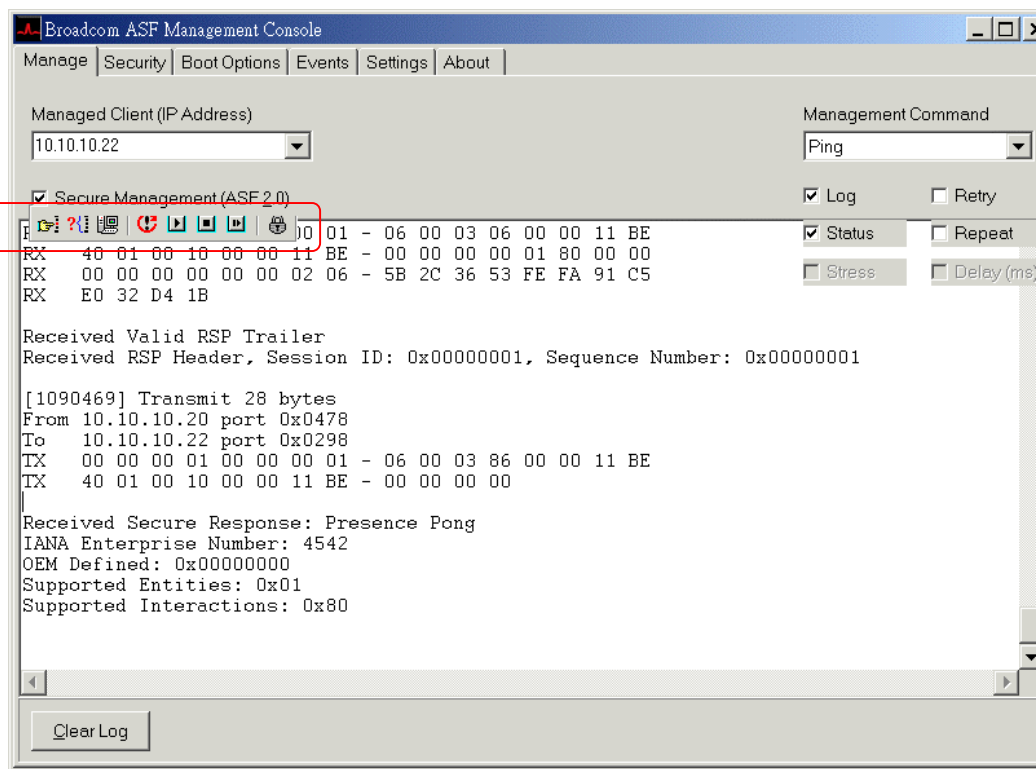


4. Receive SNMP PET



Number	IP Address	Trap Source	Event Source	Sensor	Type	Onset	Time
51	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:06:54.453
<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/> Beep
49	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:06:34.390
48	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:06:24.390
47	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:06:14.390
46	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:06:04.140
45	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:54.140
44	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:44.140
43	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:34.140
42	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:24.140
41	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:14.625
40	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:05:04.515
39	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:54.515
38	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:44.515
37	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:34.515
36	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:24.515
35	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:14.515
34	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:04:04.515
33	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:54.515
32	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:44.515
31	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:34.515
30	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:24.515
29	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:14.515
28	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:03:04.515
27	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:02:54.515
26	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:02:44.515
25	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:02:34.515
24	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:02:24.515
23	10.10.10.22	NIC	ASF	25 - Entity P...	6F	00	Jul 13 14:02:14.515

5. Test Ping, Get Status, Remote Power on, Power off, Reset, Power reset. (need test AC power lost and Remote Power on Server)



Chapter 3 - Test Items

3.1 General Configuration

- (1) Enable and disable ASF functions.
- (2) Modify the management console IP.
- (3) Modify the community.

3.2 Heartbeat Presence

- (1) Enable and disable heartbeat.

3.3 Remote Control Configuration

- (1) Verify the power on function
 - a. AC off
 - b. Send power-on command twice.
- (2) Verify the power off function.
 - a. Send power-off command twice.
- (3) Verify the reset function.
- (4) Verify the power reset function.
 - a. Send power-reset command twice.

The above functions should be checked one by one when exporting to the management console.

Note: 1. After AC lost, Remote Console can't power-on server. Need to check BIOS (configure SIO W83627TF).

2. Continue run power on twice, some BIOS will hang, need to check BIOS SMI handle.

3.4 The Deployment of Authenticated Keys

- (1) Load the authenticated keys.
- (3) Change the authenticated keys.

3.5 Remote Power Control

- (1) Secure full power function.
- (2) Secure power off function.
- (3) Secure reset function.
- (4) Secure power reset function.