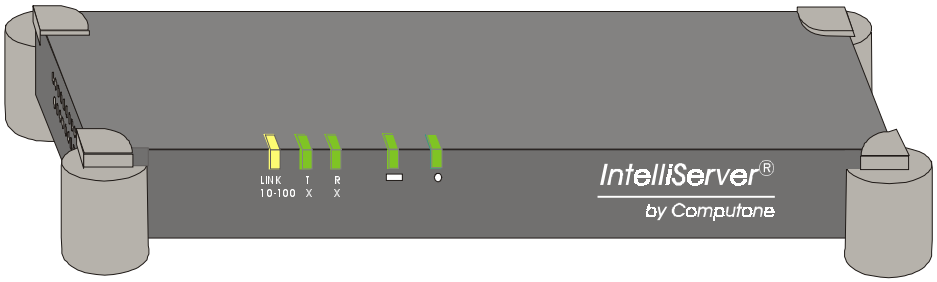
IntelliServer
Hardware Guide



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Contents

CHAPTER 1

Introduction

The IntelliServer is a high-speed, multi-port, asynchronous communication server that enables you to connect serial devices to a system, including:

- Terminals
- Printers and plotters
- Modems
- Point-of-sale (POS) devices, including cash registers
- Data collection devices, including bar code scanners
- Industrial devices with RS-232 interfaces

The IntelliServer is offered as a RAS 2004/8 or as a RCM 2004/8. Table 1 show the features and functions available.

Table 1 RAS / RCM Features and Function

Features	RAS	RCM
Hardware		
SDRAM	8 MB	8 MB
Flash Memory	2 MB	2MB
Processor Speed - MIPS	130	130
Ethernet H/W		
10 Mbps	X	X
100 Mbps	X	X
RJ45	X	X
AUI	X	X
Serial H/W		
Number of Ports	4/8	4/8
RJ45	X	X
Dedicated Console	X	X

Table 1 RAS / RCM Features and Function

Features	RAS	RCM
Port Speeds	460 Kbps	115.2 Kbps
No Solaris Break Problem		X
Networking Protocols		
TCP/IP	X	X
RSH	X	X
SSH		X
Telnet	X	X
Reverse Telent	X	X
RIPv2	X	X
SNMP	X	X
RARP	X	X
TFTP	X	X
BOOTP	X	X
DHCP	X	X
Remote Network Protocols		
CSLIP	X	X
SLIP	X	X
PPP (Static)	X	X
PPP (Dynamic)	X	X
Firewall Features		
IP Filtering (Firewall)	X	X
NAT	X	X
PPTP/VPN		X
User Security		
PAP	X	X
CHAP	X	X
MISCHAP	X	X
RADIUS	X	X
Local Users	X	X
Dial-back for Modem		X
Configuration Options		

Table 1 RAS / RCM Features and Function

Features	RAS	RCM
Web	X	X
Menu		
Command Line		
New CLI	X	X
Xmodem Configuration		
Display Configuration	X	X
Console Management		
Tip	X	X
Console Menu		X
EMP/IPM Support		X
Non-connect Port Buffer		32K
Other Features		
IntelliFeatures	X	
RSP	X	X
IservD	X	X

Unpacking and Inspection

The IntelliServer is offered as two kits. Table 1-1 shows what should be in each kit.

Table 2 IntelliServer Kit Contents

Kit - IntelliServer	
IntelliServer-8	
	IntelliServer, 8-port
	Warranty / Registration Card
	IntelliServer Documentation & Software CD
	Read Me First Card
	AC Adaptor
	Wall-mounting Bracket
IntelliServer-4	
	IntelliServer, 4-port
	Warranty / Registration Card
	IntelliServer Documentation & Software CD
	Read Me First Card
	AC Adaptor
	Wall-mounting Bracket

NOTE: You must purchase a cable kit from Tabl e3 to connect the IntelliServer to your serial device.

Table 3 Cable Kits

Cable Kits	Description
VP-RJ-DM/T	10-wire cable, 6 ft. long, RJ-45 to DB-25 (male). Connects a IntelliServer RJ-45 port to most terminals.
VP-RJ-DB/M	10-wire cable, 6 ft. long, RJ-45 to DB-25 (male). Connects a IntelliServer RJ-45 port to most modems.
8-10 Cable Pack	10-wire cable, 1 ft. long, RJ-45 (female, 8-pin) to RJ-45 (female, 10-pin), Translation Cable.
DB-9 Patch Pack	9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin) to DB-9 (female).
DB-25 Patch Pack	9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin) to DB-25 (male).

IntelliServer

The IntelliServer product provides the following features:

- An intelligent, high-performance communications controller available as 4 or 8-ports.
- 10-pin RJ-45 RS-232 ports with full DSS support
- 10/100 Base-T connector
- Dedicated console port
- AC adaptor
- Factory defaults reset switch
- Wall or desk-top mounting

Figure 1 shows a sample application using an 8-port IntelliServer. If you require more than 8 ports, you can add an additional 4-port or 8-port IntelliServer until your requirements are satisfied.

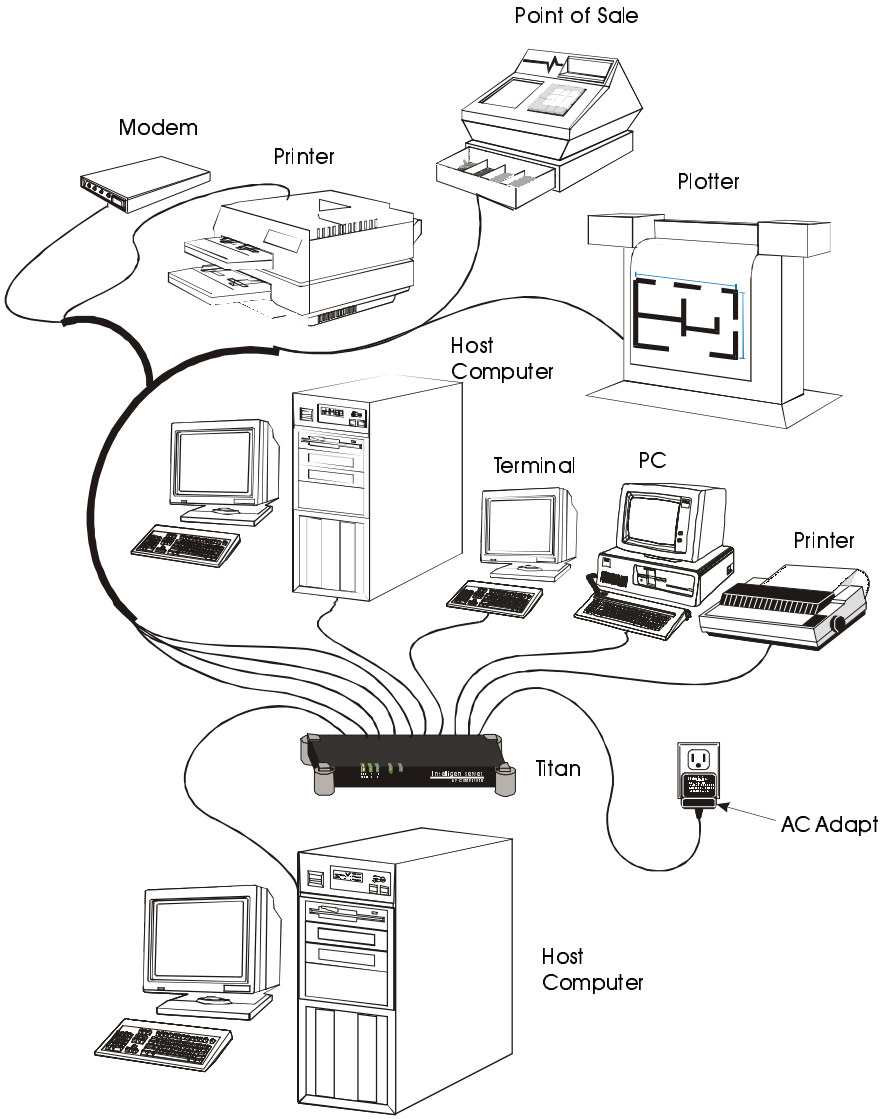

Figure 1 Example IntelliServer Application

Specifications

This section provides specifications for the IntelliServer.

Table 4 IntelliServer Specifications

PHYSICAL CHARACTERISTICS		
Length		10.75. (27.3 cm)
Width		6.75 in. (17.2 cm)
Height		1.75 in. (4.5 cm)
Weight		2 lb (.9 kg)
OPERATING CHARACTERISTICS		
Output Connector		RJ-45
Speed		50 - 460 Kbps
Serial Interface		RS-232
Surge Protection		Yes, Tx & Rx Data Lines[1]
OPERATING ENVIRONMENT		
Operating Temperature		10 - 40 °C
Temperature Gradient		10 °C / hr
Relative Humidity		10 - 90% non-condensing
Wet Bulb Temperature		35 °C maximum
Altitude		-300 - 3000 m
CERTIFICATIONS		FCC, CE, UL
WARRANTY		3 years

1 The IntelliServer products include surge/spike protection on all Transmit (TxD) and Receive (RxD) signals.

Table 5 Environmental Conditions

OPERATING		
Temperature		10 °C (50 °F) to 40 °C (104 °F)
Temperature Gradient		10 °C/Hr (18 °F/Hr)
Relative Humidity		10% to 90% non-condensing
Wet Bulb Temperature		35 °C (95 °F) maximum
Altitude		-300m (-985 ft) to 3000m (9842 ft)
NON-OPERATING STATIONARY		
Temperature		5 °C (41 °F) to 45 °C (113 °F)
Temperature Gradient		20 °C/Hr (36 °F/Hr)
Relative Humidity		5% to 95% non-condensing
Wet Bulb Temperature		35 °C (95 °F) maximum
Altitude		-300m (-984 ft) to 3000m (9842 ft)
NON-OPERATING SHIPMENT OF PACKAGED PRODUCT		
Temperature		-40 °C (-40 °F) to 60°C (140 °F
Temperature Gradient		20°C/Hr (36 °F/Hr)
Relative Humidity		5% to 95% non-condensing
Wet Bulb Temperature		29.4 °C (85 °F) maximum
Altitude		-300m(-984 ft) to 9000m (29527 ft)

RS-232 Connector Pin-outs

The following table lists the connector pin-outs for the 10-pin RJ-45 connectors.

Table 6 RS-232 Connector Pin-outs

RS-232 Signal	Direction	10-pin RJ-45
TXD	IN	7
RXD	OUT	6
RTS	OUT	9
CTS	IN	8
DTR	OUT	4
DSR	IN	10
DCD	IN	3
RI	IN	2
Signal GND	-	5
CHASSIS	-	1

Figure 1-2 illustrates the RJ-45 connector pin-out.

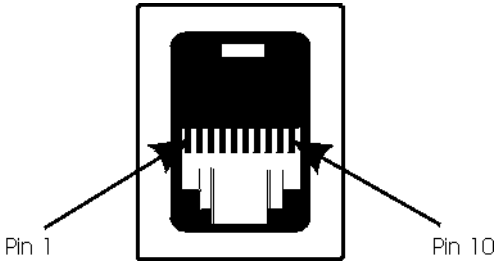

Figure 2 RJ-45 Connector Pin-out

AC Adapto

The following lists the specifications for the IntelliServer AC adaptor (power supply).

Table 7 AC Adaptor Specifications

Physical Characteristics		
Length		2.5 in. (6.4 cm)
Width		2.25 in. (5.7 cm)
Height		2.0 in. (5.1 cm)
Weight		.6 lb (270 g)
Operating Environment		
Temperature		5 ^{o}C (41 ^{o}F) to 45 ^{o}C (113 ^{o}F)
Temperature Gradient		20 ^{o}C/Hr (36 ^{o}F/Hr)
Relative Humidity		5% to 95% non-condensing
Wet Bulb Temperature		35 ^{o}C (95 ^{o}F) maximum
Altitude		-300m (-984 ft) to 3000m (9842 ft)
Certifications		UL, CSA
Power Requirements		
Input		120 VAC, 50 / 60 Hz; 18W
Output		12VDC @ 1A
Warranty		5 years

CHAPTER 2

Installation

This section provides information on the following topics:

- Hardware overview
- Desk-top installation
- Wall-mounting installation
- When power is applied

Figure 3 shows the front view of the IntelliServer cabinet.

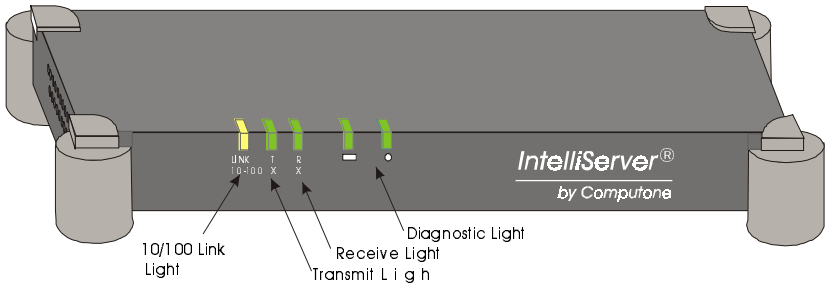

Figure 3 IntelliServer Front View

The front panel lights are defined as follows:

Table 8 Front Panel Descriptors

Light	Definition
10/100 Link	Shows the link is up when lit.
Transmit	Lights to indicate a transmission.
Receive	Lights to indicate incoming data activity.
Diagnostic	Blinks codes to indicate error codes.

Figure 4 shows the rear view of the IntelliServer.

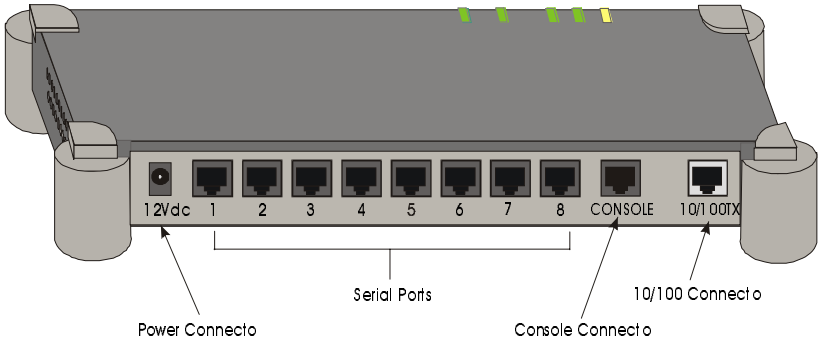

Figure 4 IntelliServer Rear View

The back panel features are defined as follows:

Table 9 Rear Panel Features

Feature	Description
Power Connector	Connect the 12VDC power from the AC adaptor here.
Serial Ports	Connect your serial devices to ports 0 through 7.
Console Port	Connect a terminal or PC to this connector
10/100 Connector	Connect a 10/100 T-base Ethernet line here.

Desk-top Installation

For desk-top installation of the IntelliServer, use the following procedure:

1. Remove the IntelliServer from the shipping carton.
2. Install feet on the other IntelliServers, if you ordered more than one.
3. Stack the IntelliServers and press down on each corner to seat firmly, if you have more than one you want to set on the desk top.

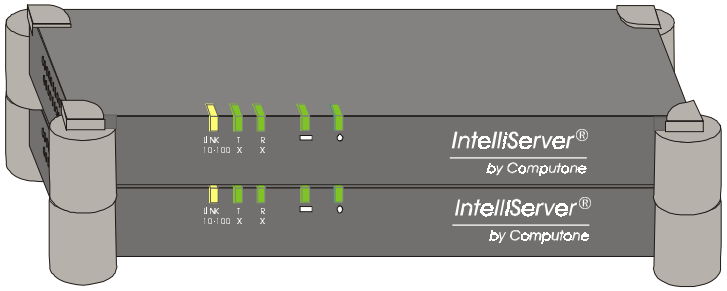

Figure 5 Stacking IntelliServers

4. Connect one end of a cable to each serial device and the other end of the cable to one of the eight ports on the back of the IntelliServer. See **Table 3** .
5. Connect a cable to the 10/100 TX connector on the IntelliServer and to the Ethernet hub.
6. Connect a terminal or PC to the console connector.
7. Plug the AC adaptor into a 120VACoutlet and connect the cable to the 12V connector on the IntelliServer. As soon as the power is connected, the IntelliServer is ON.
8. Proceed to section, **"When Power is Applied"** .

■ End of Procedure

Wall Mounting Installation

For wall mounting installation of the IntelliServer, use the following procedure:

1. Locate the mounting bracket shipped with the IntelliServer.
2. Choose a location for the mounting.

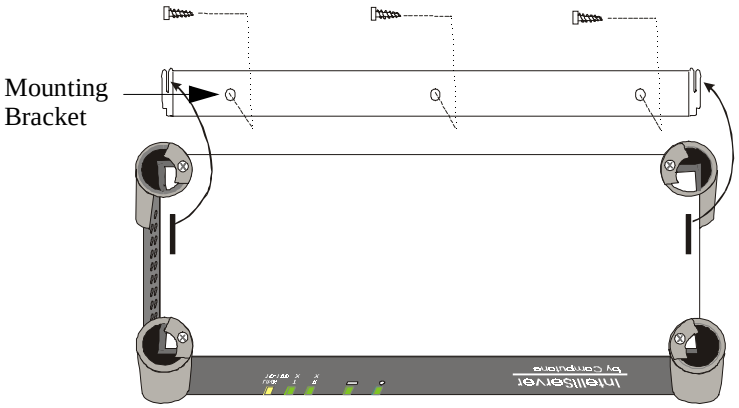

Figure 6 Wall Mounting

3. Level the mounting brackek against the wall and mark the holes for the mounting hardware.

NOTE: The mounting hardware to secure the bracked to the wall is supplied by the customer.

4. Drill pilot holes for the mounting bracket hardware.
5. Fasten the mouting bracket to the wall with the customer supplied hardware.

NOTE: The IntelliServer can be mounted so the cables can be routed from the top or from the bottom.

6. Engage the slots on the bottom of the IntelliServer with the tabs on the mounting bracket.
7. Slide the IntelliServer down to lock it into place.
8. Connect one end of a cable (See **Table 3**) to each serial device and the other end of the cable to one of the eight ports on the IntelliServer.

9. Connect a cable to the 10/100 TX connector on the IntelliServer and to the Ethernet link.
10. Connect a terminal or PC to the console connector. You need to set up your terminal or PC to match the port's factory default settings of **9600 baud**, **8-bit characters, no parity**.
11. Plug the AC adaptor into a 120VACoutlet and connect the cable to the 12V connector on the IntelliServer. As soon as the power is connected, the IntelliServer is ON.
12. Proceed to the next section "*When Power is Applied*."

■ End of Procedure

When Power is Applied

This section applies after you have attached your terminal or PC to the console connector, connected your IntelliServer to your network, and powered-up your IntelliServer. Your IntelliServer has two indicator lights or LED's; one is marked with a circle and one with a rectangle. When you apply power, they turn yellow, flashing in different combinations to indicate that the IntelliServer's power-on self-test is progressing. If an error occurs during testing, these LED's display a status or error code, as shown in Tab le10 or Table 11.

Table 10 LED Cod e

Circle	Rectangle	Description
Yellow	Yellow *(flashing)*	Power-on self-test is proceeding.
Yellow	Off	
Yellow	Green	Running Technician's interface (only occurs during manufacturing).
Yellow	Red	PROM Checksum bad.
Off	Yellow	CPU hangs trying to access serial port (console) registers.
Off	Off	At start-up, indicates that power is not present or that the IntelliServer's CPU is dead.
		During normal operation, indicates that the IntelliServer is very busy.
Off	Green	During normal operation, indicates serial port access.
Off	Red	CPU hangs trying to access the Ethernet controller.
Green	Yellow	Not Used.
Green	Off	During normal operation, indicates network access.
Green	Green	IntelliServer is completely booted and is idle.
Green *(flashing)*	Green *(flashing)*	During normal operation, the LED's flash off to indicate serial port and Ethernet access. As the IntelliServer gets busier, the lights remain off for longer periods of time.
Green	Red	Timer test failed.
Red	Yellow	Error reading CCR.
Red	Off	CPU Test failed.

Legend:

All LED colors are assumed to be steady unless indicated otherwise.

Table 10 LED Codes (Continued)

Circle	Rectangle	Description
Red	Green	CPU hangs accessing CCR and timer registers.
Red	Red	CPU hangs trying to write an error message.
Red	Flashing: Red, Yellow, Green	Fatal Error: There will be one red flash, followed by some number of yellow and green flashes. The number of flashes of each color indicates the type of error. See Table 11 .
Legend: All LED colors are assumed to be steady unless indicated otherwise.		

Table 11 LED Fatal Error Codes

Circle LED	Rectangle LED: Number of flashes of each color:			
(steady)	Red	Green	Yellow	Description
Red	1	1	0	Bad data path to DRAM.
Red	1	1	1	Bad DRAM.
Red	1	1	3	Bad CPU (data cache).
Red	1	1	4	Bad CPU (instruction cache).
Red	1	1	5	Bad DRAM data interface.
Red	1	1	6	Bad DRAM address interface.
Red	1	2	0	DRAM Data bits stuck on.
Red	1	2	1	DRAM Walking-bit Test failed.
Red	1	2	2	DRAM data bits stuck off.
Red	1	2	3	16-bit DRAM accesses bad.
Red	1	2	4	8-bit DRAM accesses bad.
Red	1	2	5	DRAM refresh bad.
Red	1	2	6	Processor byte-ordering incorrect.
Red	1	2	7	Bad configuration NVRAM (FLASH).
Red	1	3	0	CPU error (UTLB miss).
Red	1	3	1	CPU error: unexpected exception.
Red	1	3	2	CPU error: TLB failure.

Table 11 LED Fatal Error Codes (Continued)

Circle LED	Rectangle LED: Number of flashes of each color:			
(steady)	Red	Green	Yellow	Description
Red	1	3	3	Runaway Interrupts detected during P.O.S.T.
Red	1	3	4	Missing/Extra Timer Interrupts.
Red	1	3	5	Missing/Extra Local UART Interrupts.
Red	1	3	6	Missing/Extra UART Interrupts (expansion box 1 or 3).
Red	1	3	7	Missing/Extra UART Interrupts (expansion box 2).
Red	1	3	8	Missing/Extra Ethernet Interrupts.
Red	1	4	0	Bad O.S. Checksum
Red	1	4	1	Ethernet Slave Interface bad.
Red	1	4	2	Panic Message is being written to the console port. Take down the information and have it available. when you contact Computone Technical Support.
Red	1	4	3	Wrong software.
Red	1	4	4	Ethernet DMA bad.
Red	1	4	5	Ethernet CAM load error.
Red	1	4	6	Ethernet timer too slow (or main timer too fast).
Red	1	4	7	Ethernet timer too fast (or main timer too slow).
Red	1	5	0	Ethernet Loopback Failed (data error).
Red	1	5	1	Ethernet Loopback Failed (data late).
Red	1	5	2	Ethernet Loopback Failed (other).
Red	1	5	5	Serial Loopback Failed (data error).
Red	1	5	6	Serial Loopback Failed (data late).
Red	1	5	7	Serial Loopback failed (DSS error).
Red	1	5	8	Serial Loopback failed (other).
Red	1	6	?	Reserved for IntelliCluster errors (unused by IntelliServer).

If the LED's Report an Error

If the IntelliServer does not boot up properly and the LED's are reporting an error condition, record what the LED's are doing (which one is what color, whether they are steady or flashing, and if flashing, how many times of what color). Have this information at hand when you call Computone Technical Support to report the problem

Special Note about Panic Messages

If you ever see an LED error code in which the circle LED is steady red, and the rectangle LED flashes 1 red, 4 green, and 2 yellow, this indicates that the IntelliServer has encountered an unexpected software condition and is unable to continue. The IntelliServer prints a more explicit error message on the console port and usually includes a register dump. If you have a terminal connected to that port, take down any messages that are present before you restart the IntelliServer. Have this information at hand (plus the IntelliServer's software version number) when you call Computone Technical Support. These messages and the register dump can be used by our engineers to determine the cause of the failure.

When Power-on Self-test is Completed

As soon as the power-on self-test is complete, both LED's on the main unit turn green. Then, you see messages on your console terminal as shown in Table12 .

Table 12 Console Screen Messages at IntelliServer Boot Tim

`Boot Loader, Release 2.0 Version 951103`
 	
`CPU Speed = 20 MHz`
`I/D Cache = 4k/2k`
	The boot loader displays basic information like the version number and date.

`Memory = 2048k`
`Switches = 0000`
`Fast Reset = Y (DRAM tests omitted)`
`Image Size = 449k/1017k`
	This IntelliServer has 2048K, or 8 Megabytes, of SDRAM. The operating system is stored compressed in PROM. This shows both the compressed and uncompressed size. While it is uncompressing a *tumbling cursor* is displayed after the compressed size.

Table 12 Console Screen Messages at IntelliServer Boot Time (Continued)

`**********************************************`
`Computone IntelliServer`
`Release 1.3.0 Version 951103`
 	
`Kernel Text/Data/Heap = 366k/43k/193k`
`Directory = 562k`
`Memory Size/Available = 2048k/172k`
`Internet Address = 0.0.0.0`
`Ethernet Address = 00:80:69:80:09:97`
`Serial Ports = 16`
`**********************************************`
	Boot loader is finished: this banner comes from the IntelliServer's Operating System.
	
	Note the IP address is 0.0.0.0, because network parameters have not been configured yet.
	
	There is an Ethernet Address: every IntelliServer has a unique one.

`Network boot enabled`
`Sending bootp...`
`Sending rarp...`
`Sending bootp...`
`Sending rarp...`
`Sending bootp...`
`Sending rarp...`
`No reply.`
	The *bootp* and *rarp* messages will be repeated a few times, assuming you have not configured a BOOTP or RARP server.

`NOTICE: Booting prom kernel.`
 	
`Boot Loader, Release 1.3.0 Version 951103`
 	
`CPU Speed = 20 MHz`
`I/D Cache = 4k/2k`
`Memory = 2048k`
`Switches = 0000`
`Soft Boot = Y (DRAM tests omitted)`
`Image Size = 449k/1017k`
	Because there was no reply containing net-boot information.
	
	Here is the boot loader again. Had the IntelliServer been booting a kernel from the network, this would be *that* kernel's boot loader. Here is the same one.

`**********************************************`
`Computone IntelliServer`
`Release 1.3.0 Version 951103`
 	
`Kernel Text/Data/Heap = 366k/43k/461k`
`Directory = 562k`
`Memory Size/Available = 2048k/544k`
`Internet Address = 0.0.0.0`
`Ethernet Address = 00:80:69:80:09:97`
`Serial Ports = 16`
 	
`**********************************************`
`Sending bootp...`
`Sending rarp...`
`Sending bootp...`
`Sending rarp...`
	Comparing this message to the first, notice that the Kernel Heap was 193K the first time, and is now 461K. The available memory (for applications) was originally 172K, but is now 544K.
	
	The first time, the software had configured its memory in preparation for net-booting. The second time, knowing there would be no net-booting, it configured itself for normal operation.

Table 12 Console Screen Messages at IntelliServer Boot Time (Continued)

`Sending bootp...`
`Sending rarp...`
`No reply.`
 	
`init: need ip address to start network`
`508 KB available memory`
 	
`#`
	Because there is still no IP address, it's again with the *bootp, rarp*.
	
	After a reminder that you still don't have an IP address, you get a command prompt.

Your messages will not look exactly like this: software versions later than this printing may have different sizes and release dates. The number of serial ports will vary from site to site, and so on. Still, this gives you an idea what to expect.

To configure the IntelliServer software, refer to the *IntelliServer Software Configuration Guide*.