

## The Answer to the Ultimate Question of....

等等,等等……

我的电脑有多少个……

······ 的地址在······

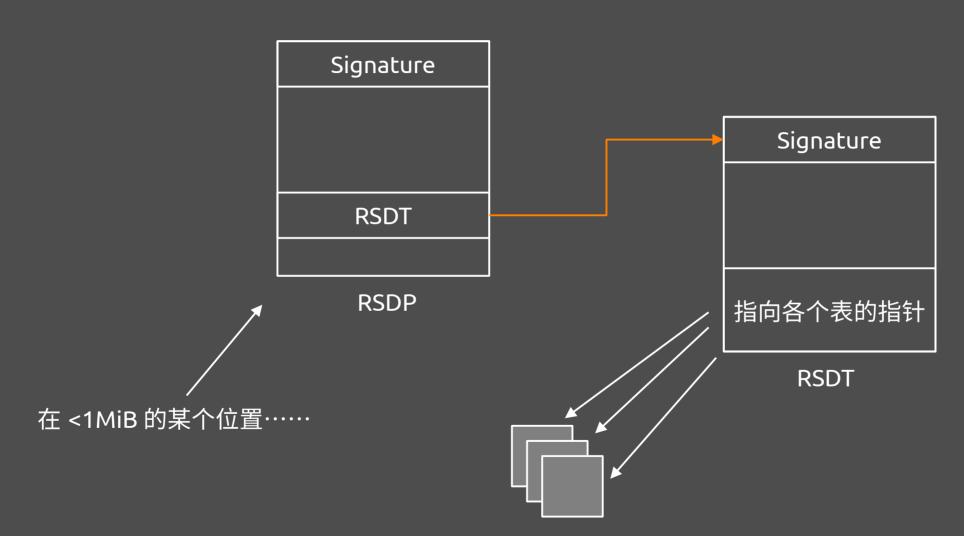
**ACPI** 

我怎么配置……

关机,重启,休眠

ACPI 使用一堆系统描述表( System Description Table )和 一套其自定义的语言 AML 去告诉我们这些答案

## ACPI 两步走



#### Advanced Configuration and Power Interface (AC

), which should conspicuously be placed in the same location as this specification.

Table 5.5: DESCRIPTION\_HEADER Signatures for tab

Signature         Description         Reference           "APIC"         Multiple APIC Description Table         Section 52.12           "BERT"         Boot Error Record Table         Section 52.18           "BGRI"         Boot Graphics Resource Table         Section 5.2.18           "CPEP"         Corrected Platform Error Polling Table         Section 5.2.18           "EDSDT"         Differentiated System Description Table         Section 5.2.18           "ECDT"         Embedded Controller Boot Resources         Section 5.2.15           Table         Section 18.5         Section 18.6.1           "ERST"         Error Record Serialization Table         Section 18.5           "ERST"         Fired Placeription Table (FADT)         Section 5.2.10           "FACP"         Fired ACPI Description Table (FADT)         Section 5.2.10           "FPDT"         Firmware ACPI Control Structure         Section 5.2.10           "FPDT"         Firmware Performance Data Table         Section 5.2.24           "MSCT"         Maximum System Characteristics Table         Section 5.2.24           "MSCT"         Memory Power StateTable         Section 5.2.25           "NFIT"         NVDIMM Firmware Interface Table         Section 5.2.25           "OEMS Specific Information Tables         Section 5.2.26		by ACF1					
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	"SRAT"	System Resource Affinity Table	Section 5.2.16				
	"SSDT"	Secondary System Description Table Section 5.2.11.					
	"XSDT"						

Table 5.6: DESCRIPTION\_HEADER Signatures for table by ACPI

Signature	Description and External Reference
"AEST"	Arm Error Source Table. See Links to ACPI-Related Doo
	"Arm Error Source Table".
"BDAT"	BIOS Data ACPI Table - exposing platform margining
	Related Documents under the heading "BIOS Data ACPI Ta
"BOOT"	Reserved Signature
"CDIT"	Component Distance Information Table. See Links to
	under the heading "Component Distance Information Table

Table E.S., continued from provious page

	rable 5.6 – continued from previous page			
Signature	Description and External Reference			
"CEDT"	CXL Early Discovery Table. See "Links to ACPI-Related Documents" (http://uefi.			
	org/acpi) under the heading "CXL Early Discovery Table".			
"CRAT"	Component Resource Attribute Table. See Links to ACPI-Related Documents under			
	the heading "Component Resource Attribute Table".			
"CSRT"	Core System Resource Table. See Links to ACPI-Related Documents under the head-			
	ing "Core System Resour			
"DBGP"	Debug Port Table. See L. Table 5.6			
	Port Table".			

Debug Port Table 2. See

DMA Remapping Table "DMA Remapping Table" Dynamic Root of Trust

ments under the heading '

Event Timer Description This signature has been so

IA-PC High Precision E under the heading "IA-PC

iSCSI Boot Firmware Ta ing "iSCSI Boot Firmwar

I/O Remapping Table. "I/O Remapping Table".

I/O Virtualization Repo der the heading "I/O Virtu Low Power Idle Table.

"Low Power Idle Table". PCI Express Memory-m

PCI Firmware Specificati under the heading "PCI S Management Controller

Transport Protocol (MCT Documents under the hea Am Memory Partitionia

under the heading "Arm N

Microsoft Data Manage the heading "Microsoft Se

Platform Runtime Mech the heading "Platform Ru

Regulatory Graphics Re

the heading "Regulatory (

Software Delegated Exc

bug Port Table 2".

"DBPG2"

"DMAR"

"DRTM"

"ETDT

"HPET"

"IBFT"

"IORT"

"IVRS"

"LPIT"

"MCFG"

"MCHI"

"MPAM"

"MSDM"

"PRMT"

"RGRT"

"SDEI"

	Table 5.6 – continued from previous page
Signature	Description and External Reference
"SVKL"	Storage Volume Key Data table in the Intel Trusted Domain Extensions. See Links
	to ACPI-Related Documents under the heading "Storage Volume Key Data".
"TCPA"	Trusted Computing Platform Alliance Capabilities Table. TCPA PC Specific Im-
	plementation Specification. See Links to ACPI-Related Documents under the heading
	"Trusted Computing Platform Alliance Capabilities Table".
"TPM2"	Trusted Platform Module 2 Table. See Links to ACPI-Related Documents under the
	heading "Trusted Platform Module 2 Table".
"UEFI"	Unified Extensible Firmware Interface Specification. See the UEFI Specifications
	web page.
"WAET"	Windows ACPI Emulated Devices Table**. See Links to ACPI-Related Documents
	under the heading "Windows ACPI Emulated Devices Table".
"WDAT"	Watch Dog Action Table. Requirements for Hardware Watchdog Timers Supported
	by Windows - Design Specification. See Links to ACPI-Related Documents under the
	heading "Watchdog Action Table (WDAT)".
"WDRT"	Watchdog Resource Table. Watchdog Timer Hardware Requirements for Windows
	Server 2003. See Links to ACPI-Related Documents under the heading "Watchdog
	Timer Resource Table (WDRT)".
"WPBT"	Windows Platform Binary Table. See Links to ACPI-Related Documents under the
	heading "Windows Platform Binary Table".
"WSMT"	Windows Security Mitigations Table. See Links to ACPI-Related Documents under
	the heading "Windows SMM Security Mitigations Table (WSMT)."
"XENV"	Xen Project. See Links to ACPI-Related Documents under the heading Xen Project
	Table.

under the heading "Software Delegated Exceptions Interface."

"SLIC"	Microsoft Software Licensing table. See Links to ACPI-Related Documents under
	the heading "Microsoft Software Licensing Table Specification".
"SPCR"	Microsoft Serial Port Console Redirection table. See Links to ACPI-Related Docu-
	ments under the heading "Serial Port Console Redirection Table".
"SPMI"	Server Platform Management Interface table. See Links to ACPI-Related Docu-
	ments under the heading "Server Platform Management Interface Table".
"STAO"	_STA Override table. See Links to ACPI-Related Documents under the heading
	" STA Override Table".

continues on next page

### 5.2.5.1 Finding the RSDP on IA-PC Systems

OSPM finds the Root System Description Pointer (RSDP) structure by searching physical memory ranges on 16-byte boundaries for a valid Root System Description Pointer structure signature and checksum match as follows:

- The first 1 KB of the Extended BIOS Data Area (EBDA). For EISA or MCA systems, the EBDA can be found in the two-byte location 40:0Eh on the BIOS data area.
- The BIOS read-only memory space between 0E0000h and 0FFFFFh.

#### 5.2.5.3 Root System Description Pointer (RSDP) Structure

The revision number contained within the structure indicates the size of the table structure.

Table 5.3: **RSDP Structure** 

Field	Byte Lenath	Byte Offset	Description	
Signature	8	0	"RSD PTR" (Notice that this signature must contain a trailing blank character.)	
Checksum	1	8	This is the checksum of the fields defined in the ACPI 1.0 spec-	



## 寻找 IOAPIC 寄存器的映射地址

#1. 找到 MADT

#2. 找到 I/O APIC Structure

Table 5.19 – continued from previous page			
Field	Byte	Byte	Description
	Length	Offset	
Signature	4	0	'APIC' Signature for the Multiple APIC Description Table.
Length	4	4	Length, in bytes, of the entire MADT.
Revision	1	8	5
Checksum	1	9	Entire table must sum to zero.
OEMID	6	10	OEM ID
OEM Table ID	8	16	For the MADT, the table ID is the manufacturer model ID.
OEM Revision	4	24	OEM revision of MADT for supplied OEM Table ID.
Creator ID	4	28	Vendor ID of utility that created the table. For tables contain-
			ing Definition Blocks, this is the ID for the ASL Compiler.
Creator Revision	4	32	Revision of utility that created the table. For tables containing
			Definition Blocks, this is the revision for the ASL Compiler.
Local Interrupt Controller	4	36	The 32-bit physical address at which each processor can ac-
Address			cess its local interrupt controller.
Flags	4	40	Multiple APIC flags. See Multiple APIC Flags for a descrip-
			tion of this field.
Interrupt Controller Struc-	_	44	A list of interrupt controller structures for this implementa-
ture[n]			tion. This list will contain all of the structures from Interrupt
			Controller Structure Types needed to support this platform.
			These structures are described in the following sections.

Table 5.24: I/O APIC Structure

Table 5.24. I/O ATTE Structure			
Field	Byte	Byte	Description
	Length	Offset	
Туре	1	0	1 I/O APIC structure
Length	1	1	12
I/O APIC ID	1	2	The I/O APIC's ID.
Reserved	1	3	0
I/O APIC Address	4	4	The 32-bit physical address to access this I/O APIC. Each I/O APIC resides at a unique address.
$\sim$			AFIC lesides at a unique address.

Bingo!

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## 额外的注意事项

#### 5.2.12.5 Interrupt Source Override Structure

Interrupt Source Overrides are necessary to describe variances between the IA-PC standard dual 8259 interrupt definition and the platform's implementation.

It is assumed that the ISA interrupts will be identity-mapped into the first I/O APIC sources. Most existing APIC designs, however, will contain at least one exception to this assumption. The Interrupt Source Override Structure is provided in order to describe these exceptions. It is not necessary to provide an Interrupt Source Override for every ISA interrupt. Only those that are not identity-mapped onto the APIC interrupt inputs need be described.

· This specification only supports overriding ISA interrupt sources.

For example, if your machine has the ISA Programmable Interrupt Timer (PIT) connected to ISA IRQ 0, but in APIC mode, it is connected to I/O APIC interrupt input 2, then you would need an Interrupt Source Override where the source entry is '0' and the Global System Interrupt is '2.'

Table 5.25: Interrupt Source Override Structure

Field	Byte Length	Byte Offset	Description
Type	1	0	2 Interrupt Source Override
Length	1	1	10
Bus	1	2	0 Constant, meaning ISA
Source	1	3	Bus-relative interrupt source (IRQ)
Global System Interrupt	4	4	The Global System Interrupt that this bus-relative interrupt
			source will signal.
Flags	2	8	MPS INTI flags. See the corresponding tabel below for a de-
			scription of this field.

# Code Time