In order to track the computing inventory of a large organization, the schema below has been designed.

**Computer**
- **CInventNum**
- **ComputerName**
- **ComputerType**
- **AccID**

**AccessorySet**
- **AccID**
- **AInventNum**
- **HVendorID**
- **AccName**
- **AccType**
- **AccSize**

**Software**
- **SInventNum**
- **SVendorID**
- **SWName**
- **SWVersion**

**Inventory**
- **InvenNum**
- **SerialNum**
- **PONum**
- **PODate**
- **DeliveredDate**
- **POCost**
- **VendorID**

**InstalledSoftware**
- **CInventNum**
- **SWInventNum**

**HardwareVendor**
- **HVendorID**
- **HVName**
- **HVAddr**
- **ModelNum**
- **ModelName**
- **ModelDescr**

**SoftwareVendor**
- **SVendorID**
- **SVName**
- **SVAddr**
- **SWName**
- **SWVersion**
- **SWDesc**

**Vendor**
- **VendorID**
- **HWFlag**
- **HWVendorID**
- **SWFlag**
- **SWVendorID**

Computer Table: A computer as identified by its ComputerType (PC, laptop, handheld, etc.) is tracked by an organization's inventory numbering scheme (CInventNum). ComputerName is a candidate key. Note that we cannot use serial numbers since we cannot guarantee uniqueness across vendors. Each computer tuple may have multiple accessories (AccID) - see below; hence the key of InventNum and AccID for this table.

AccessorySet Table: For each computer, we track a set of accessories by identifier (AccID) and by vendor (HVendorID) by using a three tuple of name (AccName such as Keyboard, Mouse, Monitor, CR_RW, DVD, external disk, etc.), type (AccType - for Keyboard, the AccType's could be regular, wireless, thumb, etc.), and for some AccTypes, the size (AccSize - for Monitor, it could be the diagonal length while for external disk it could be the number of gigabytes). The same AccName may be differentiated by AccID, VendorID, AccType, and AccSize combination. Accessories must be from hardware vendors and are purchased (AInventNum).

Software Table: Software that the organization has purchased is in the software table and is tracked by the organization's inventory numbering scheme (SInventNum - a primary key); thus, software can only be from software vendors. For each piece of software (operating system, database, document, etc.) we also track the triple of a software vendor ID (SVendorID), name of the software (SWName such as Windows, MacOS, Oracle, PalmOS, etc.), and version of the software (SWVersion such as 1.1, 2.0, 1.3, 2000, XP, etc.). All of these values must be non-null.

Inventory Table: This table tracks any of the hardware or software that has been purchased. The purchase order number (PONum) is the key, and unique for anything purchased by the organization. The inventory number (Inven) is unique across all purchased items, but is initially null until the item arrives. The serial number may not be unique since different manufacturers can reuse numbers (and it is also null until the item arrives). The PODate, POCost, and VendorID are known at the time of purchase; the DeliveredDate is set upon delivery of the item and is null until that point in time.

InstalledSoftware: This table contains linkages that track the installed software (via SWInventNum) on each hardware device (via CInventNum).

HardwareVendor: For each hardware vendor, there is a unique ID (HVvendorID), name (HVName), address (HVAddr), model number (ModelNum), model name (ModelName), and description (ModelDescr). Note that HVvendorID in conjunction with ModelNum is used to uniquely identify every product.

SoftwareVendor: For each software vendor, there is a unique ID (SVendorID), name (SVName), address (SVAddr), software name (SWName), version (SWVersion), and description (SWDescr). Note that SVendorID in conjunction with SWName and SWVersion is used to uniquely identify every product.

Vendor: In order to track all vendors with a common unique key, this table introduces an artificial VendorID. If the HWFlag (SWFlag) is true, then HVvendorID (SVendorID) has a value. Note that both can be true, when means that a vendor is both a hardware and a software vendor.

Data types and values:
- **VendorID** (V1, V2, V3, ...);
- **HVendorID** (HV1, HV2, HV3, ...);
- **SVendorID** (SV1, SV2, SV3, ...);
- **AccID** (A1, A2, A3, ...);
- **InvenNum**, **SInventNum**, **CInventNum**, **AInventNum**: Integer;
- **HWFlag**, **SWFlag**: Boolean;
- **PODate**, **DeliveredDate**: Date;
- **POCost**: float;
- and all remaining fields not yet listed are String.
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Computer(CInventNum, ComputerName, ComputerType, AccID);
123456789  Server1  Server  A1
123456789  Server1  Server  A2
999999999  Laptop1  Laptop  A3
888888888  CEO_PDA  PDA  A5
888888888  CEO_PDA  PDA  A6

Accessory(AccID, AInventNum, HVVendorID, AccName, AccType, AccSize);
A1   111111111  HV111  Tape  Reel  20MB
A2   222222222  HV777  KB/Mouse  Wireless null
A3   333333333  HV555  Mouse  Wireless null
A4   444444444  HV444  ExtHD  USB  120GB
A5   878787878  HV333  ThumbKB  Plugin null
A6   101010101  HV333  Headph  Plugin null

Software(SInventNum, SVendorID, SWName, SWVersion);
454545454  SV124  Windows  XP
555555555  SV124  VisualC++  5.0
000001111  SV001  VMS  7.0
999990000  SV001  C  3.1
777777777  SV573  Together  5.0
565656565  SV222  PalmOS  2.3

Inventory(InvenNum, SerialNum, PONum, PODate, DeliveredDate, POCost, VendorID);
123456789 Vax3424 P02348 10-08-83 12-22-83 250,000 V00002
123456789 Vax3424 P35363 07-07-02 08-01-03 1,999 V00005
123456789 Vax3424 D3kc830 02-22-06 03-10-06 2,394 V00005
123456789 Vax3424 458sdaf 01-01-05 01-15-05 299 V00003
123456789 Vax3424 582782 01-01-06 01-15-06 8,354 V00234
123456789 Vax3424 Dec3421 01-01-07 01-23-07 499 V00006

InstalledSoftware(CInventNum, SWInventNum);
123456789  000001111
123456789  999990000
999999999  454545454
999999999  555555555
999999999  777777777
888888888  565656565

HardwareVendor(HVendorID, HVName, HVAddr, ModelNum, ModelName, ModelDescr);
HV111  DEC  MaynardMA  750  Vax  Minicomputer
HV111  DEC  MaynardMA  11-44  PDP  Microcomputer
HV897  Dell  RoundRockTX N1730  XPS  PC
HV777  Micros  RedmondWA  4000  Wireless  Keyboard/Mouse
HV555  Logitech  FreemontCA  MX  Revolution  HighEnd Mouse
HV333  Palm  SunnyvaleCA  500  PalmPilot  Handheld

SoftwareVendor(SVendorID, SVName, SVAddr, SWName, SWVersion, SWDesc);
SV124  Micros  RedmondWA  Windows  2000  OldOS
SV124  Micros  RedmondWA  Windows  95  OlderOS
SV124  Micros  RedmondWA  Windows  3.0  AncientOS
SV001  DEC  MaynardMA  VMS  7.0  MinicomputerOS
SV001  DEC  MaynardMA  C  3.1  ProgrammingLang
SV573  Borland  AustinTX  Together  5.0  UMLTool
SV222  Palm  SunnyvaleCA  PalmOS  2.3  HandheldOS

Vendor(VendorID, HWFlag, HWVendorID, SWFlag, SWVendorID);
V00001  True  HV555  False  null
V00002  True  HV111  True  SV001
V00003  True  HV777  True  SV124
V00004  False  null  True  SV573
V00005  True  HV897  True  SV778
V00006  True  HV333  True  SV222