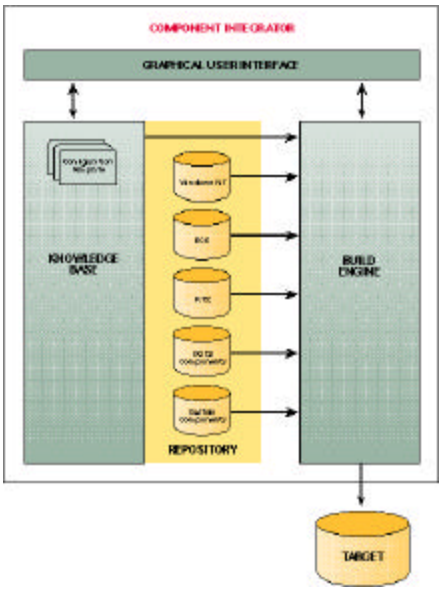
VenturCom's *Component Integrator* delivers the benefits of ***Windows NT*** to the dedicated, embedded, and real-time markets. ***Component Integrator*** is a modular and extensible system for *engineering* and *deploying* embedded ***Windows NT*** products.

Component Integrator provides complete support for target system development, including system and application software component *integration*, system *design* and *configuration*, and target *building*.

Component Integrator decomposes ***Windows NT*** into a hierarchy of individually selectable components with which to design target system configurations. Configurations can be created that span the range from minimal run-time support for a single application – with a file system footprint of less than 10 MB – up to complete ***NT Workstation*** or ***NT Server*** installations.



Definitions

Repository - contains all files to be used on a target system
Configuration Template - is a high level description of a target system
Knowledge Base - contains the Configuration Templates, detailed descriptions of software components, and the map of the Repository
Build Engine - is the tool that creates a target system as defined by the Configuration Template

With Component Integrator, system developers can rapidly create target systems for testing or deployment.

INTEGRATION

Component Integrator is distributed with a complete set of ***Windows NT Workstation*** components, with additional ***Windows NT Server*** components available separately. Also included are **VenturCom**-developed ***Windows NT*** extensions that provide value-added capabilities for embedded and real-time control.

Component Integrator is fully extensible by OEMs and third parties. With ***Component Integrator's*** component kit definition language (***KDF***) and ***Component Creator*** (***CI/CC***), additional capabilities can be defined and additional components easily created for end-user applications, OEM device drivers and system services, and third-party applications.

DESIGN

Component Integrator's System Designer (***CI/SD***) is an interactive graphical environment for engineering ***Windows NT*** target system configurations. It manages user-defined collections of target system configurations. It provides straightforward interfaces for creating, editing, configuring, extending, and building target systems.

For each target configuration**, *CI/SD*** manages a complete working model of the ***NT*** registry hive and file system. With ***CI/SD***, targets may be configured in a model environment exactly as they would on a live system; targets may be configured through CI/SD ***Windows*** control panels for all the standard system components or via registry editing operations and direct file manipulations.

BUILD

Component Integrator's Target Build Engine provides complete capabilities for producing bootable target systems.

- formats target media and prepares file systems according to target configuration settings.
- marshals files from component source repositories onto the target file systems.

- marshals registry parameters from the ***CI/SD*** model registry and composes registry hives for the target.

Component repositories are managed such that targets can be built using components from a range of sources, including an **NT** distribution CD and OEM, third-party, or end-user collections. These can reside anywhere in the development host's file system or other network accessible location. Automatic service pack updating can be performed on the fly (as targets are built) from a special repository for an available copy of the desired ***NT*** service pack. Users can apply service packs immediately as they become available from **Microsoft.**

The ***CI*** Target Build Engine has further capabilities for quick manufacturing in a production setting by incrementally serializing targets. Serial numbers may be directly scanned from a **Microsoft** COA and applied on the fly.

The Embedded Component Kit (ECK) consists of a suite of specialized Windows NT drivers and components essential for using Windows NT in deeply embedded systems. This kit includes:

- **Null-Display and Null-Input Support** (Lights-out Operation)
  Allows NT to boot and initialize on a platform without a video adapter installed. Those portions of Windows NT that normally interact with the video hardware and GDI/DDI subsystems will continue to operate in the absence of such hardware.
- **Small Footprint**
  Contains the minimum executables, DLLs, drivers, registry information, and a default user profile with full-access permissions. This is the starting point for creating the smallest possible target system.
- **Flash Support**
  Allows a small footprint system to boot and run from less than 10 MB of flash memory.
- **No Paging**
  Eliminates the disk or flash necessary to support
- **ROM Support**
  Allows NT to run on read-only media, including flash and CD-ROM

FEATURES

Component Integrator includes a complete set of ***Windows NT*** components with which to create target configurations. The high-level hierarchy with approximate component counts and typical sizes is shown at right.

Capabilities	Component Count	Component Size
System		
Platform		
Hardware	1	--
OS + App Runtime	2	8.0 - 48.2 Mb
HAL	13	80 Kb
Virtual Memory	9	0.16 - 64.0 Mb
Authority	1	29 Kb
Services	1	
Disk Storage		
Disks	4	20 Kb
File Systems	3	200 Kb
Boot Parameters	1	--
HD Write Filter	1	9 Kb
Display		
Display Adapters	210	200 Kb
Keyboard		
Keyboard Layout	14	9 Kb
Keyboard Drivers	11	34 Kb
Keyboard Input Locale	14	144 Kb
Mouse	14	14 Kb
Floppy	2	20 Kb
CD-ROM	2	22 Kb
Network		
Net Identification	1	--
Net Adapters	24	40 Kb
Net Protocols	7	2.0 Mb
Net Services	19	4.1 Mb
SCSI		
SCSI Adapters	57	20 Kb
Ports	5	44 Kb
Modems	212	914 Kb
Multimedia	5	1.0 Mb
Telephony	1	414 Kb
Fonts	11	200 Kb
Accessibility	1	10 Kb
Plug and Play	1	22 Kb
PCMCIA	1	541 Kb
User Administration		
Security	1	--
Profiles	1	341 Kb
Overrides		
Registry		
File(s)		
Startup Application	5	--
Applications		
Utilities	10	20 Kb - 4 Mb
Accessories	10	20 Kb - 3 Mb
Multimedia		
Communications	1	455 Kb
Games	4	300 Kb
Add-Ins		
User		
OEM		

CI includes dozens of templates and example configurations, a selection of which is shown below.

Sample Configuration	Size (Mb)

Embedded SCSI, No Page File	9.7
Bootable CD-ROM	13.2
Embedded IDE, Minimal TCP/IP	16.1
Smallest Full Networking	19.5
Full NT, Full Networking, No Page File	67.6
Standard Japanese networked system	91.6
Full NT, Full Networking, 32 Mb Page File	99.6