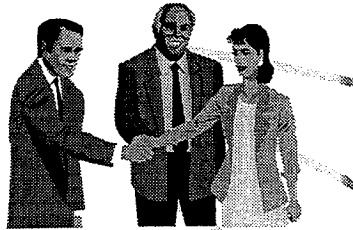# The Server in Client/Server

Writing Windows NT Services Using
Clarion for Windows
**By E E Mindlin**

JDA Software Group, Inc. © 1997

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# Introductions

- Who am I?
- Who are you?.

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# Agenda

- What is a Windows NT Service?
- Why use Windows NT Services?
- In Depth...
  - Service Control Manager
  - The Control Panel Applet
  - Registry Entries
  - The Service Application
  - Issues to Be Aware of ( i.e. Threads, Debugging)
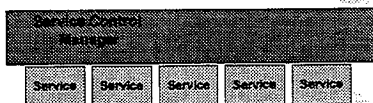  - Questions???.

## What is a Windows NT Service?

- Just like a regular application
- Used for...
  - Transaction Processing
  - Timed Events
  - Network Applications
  - Device Drivers
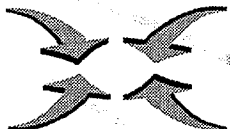  - Anything else you can think of...

## Service Control Manager (SCM)

- Windows NT™ System Process
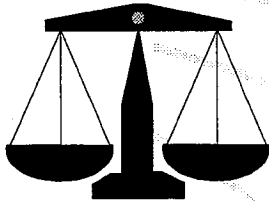- Unified and Secure
- Application Object Broker?

## Inside the Service

- After SCM Creates Our Service
  - StartServiceContolDispath Win32 API
  - Connects Main Thread of a Service Process to the SCM
  - Register Control Handler.

## NT Threads vs. CW Threads

- Clarion Threads
  - Actually Creates an NT Thread
  - START()
  - THREAD()
  - ACCEPT Loop
  - YIELD().

## ...NT Threads

- NT Thread Scheduler
  - Thread Priorities
  - O/S Decides when to YIELD()
- How does this relate to writing Windows NT Services?.

## It's the SCM...

- SCM Creates a Thread
  - Calls our Entry Point
  - Waits until the Entry Function has completed
- Falls outside of Clarions Thread Management
  - THREAD() Returns CW Thread...not O/S
  - CW Threads YIELD() in the ACCEPT
  - NT YIELD()'s when it wants.

## Registry Entries

- Special Registry API Functions
  - CreateService()
  - DeleteService()
- Must Use
- Assists Control Panel Applet.

## Control Panel Applet

- Starting Services
- Stop a Service
- Pause
- Interact With Desktop
- User Account to Run Under.

## The Service Application

- Regular Executable
- Application Protocol
  - StartServiceCtrlDispatcher
  - RegisterServiceCtrlHandler.

## Control Dispatcher

- Windows 32bit API Function
- Parameter is ServiceTable
  - Service Name (as String)
  - Main Service Entry Point
- Blocks until ServiceMain returns.

## Control Handler

- Responsible for Handling User Interface
- Responds to Events
  - SendStatusToSCM
  - Status Codes

## Threading Issues

- ServiceMain is called by SCM
  - CW's "Main" Thread is no longer main
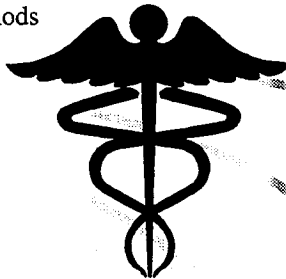  - Application will terminate when this thread has completed.

## START()

- Calls procedure passed as parameter
- Threads yield with ACCEPT loop
- Only threads managed with this function will retain the THREADED attribute
- Remember the SCM started our ServiceMain.

## CreateThread() Win32 API

- Can use this instead
- Managed by operating system
- Can pass a parameter.

## Saving the Processor(s)

- Synchronization Methods
  - Events
  - Critical Sections
  - Others not covered
- Non-Polling Design
  - Wait for an Event.

## NT Event Log

- The Message File
- Message Compiler (MC)
  - Compiles to a Resource
  - Links to End of Binary
- Registry Entries
- RegisterEventSource Win32 API Call.

## Debugging Issues

- Process runs as System Account
  - Process is started by the SCM
- CW Debugger can not "attach" to running process
- Use Log Files
- An Error.txt File.

## More About Debugging

- Use Command Line Parameters
  - Debug Switch
  - Install Switch
  - Un-Install Switch
- Use Interact With Desktop and MessageBox.

## The MS Back Office Logo

- Runs as a Service
- Support TCP/IP AND IPX/SPX if Network Application
  - Use Winsock 2
- Install and Uninstall
- Installable via SMS.

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## Questions?