

## Assignment one: Translate the following technical text from Serbian to English:

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 Mark Russinovich – *Windows Internals* (p. 300)

### The Service Control Manager (SCM)

The SCM's executable file is `%SystemRoot%\System32\Services.exe`, and like most service processes, it runs as a Windows console program. The **Wininit process** starts the SCM early during system boot (see Chapter 13 for details on the boot process). The SCM's startup function, **SvcCtrlMain**, orchestrates the launching of services that are configured for automatic startup.

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### ◆ Initialization and Synchronization

SvcCtrlMain first creates a synchronization event named **SvcctrlStartEvent\_A3752DX**, which it initializes as nonsignaled. Only after the SCM completes all steps necessary to prepare itself to receive commands from SCPs does it set the event to a signaled state.

The function that a Service Control Program (SCP) uses to establish communication with the SCM is **OpenSCManager**. OpenSCManager prevents an SCP from contacting the SCM before initialization is complete by waiting for **SvcctrlStartEvent\_A3752DX** to become signaled.

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### ◆ Building the Service Database

Next, SvcCtrlMain calls **ScGenerateServiceDB**, which builds the SCM's internal service database.

ScGenerateServiceDB reads and stores the contents of:

**HKLM\SYSTEM\CurrentControlSet\Control\ServiceGroupOrder\List**

This is a **REG\_MULTI\_SZ** value that defines the names and order of service groups.

A service's registry key may contain an optional **Group** value, used when a service or device driver must control its startup order relative to services in other groups. For example, the Windows networking stack is built from the bottom up, so networking services must be assigned Group values that place them later in the startup sequence than networking device drivers.

The SCM internally constructs a group list that preserves the registry-defined ordering. Common groups include (but are not limited to):

- NDIS
- TDI
- Primary Disk
- Keyboard Port

- Keyboard Class

Third-party applications can also define custom groups. For example, **Microsoft Transaction Server** adds a group named **MS Transactions**.

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#### ◆ Service Enumeration and Database Construction

ScGenerateServiceDB then scans:

**HKLM\SYSTEM\CurrentControlSet\Services**

It creates an entry in the service database for each key it encounters.

Each database entry includes:

- Service-related parameters
- Fields tracking service status

The SCM adds entries for both services and device drivers because it:

- Starts auto-start services and drivers
- Detects startup failures for boot-start and system-start drivers
- Allows applications to query driver status

The **I/O manager** loads boot-start and system-start drivers before any user-mode processes execute, meaning such drivers are already loaded before the SCM begins operation.

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#### ◆ Dependencies and Ordering

ScGenerateServiceDB also reads each service's **Group** value and associates it with the corresponding group entry in the group list.

Additionally, it records service dependencies by reading:

- **DependOnGroup**
- **DependOnService**

These values define inter-service startup dependencies.

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#### ◆ Service List Organization

Figure 4-12 illustrates how the SCM organizes the service entry list and group order list. The service list is **alphabetically sorted** because it is built from the registry, and Windows stores registry keys in alphabetical order.

Assignment 2: Please translate this text from English to Serbian. TERENCE TAO – ANALYSIS (pp. 84–92)

## CHAPTER 2: THE INTEGERS

We built up most of the basic properties of the natural number system, but we have reached the limits of what one can do with just addition and multiplication. We now introduce a new operation, subtraction, but to do this properly we must move from the natural numbers to a larger system: the integers.

Informally, integers are what you get by subtracting two natural numbers. For example,  $3 - 5$  and  $6 - 2$  should be integers.

However, this is not a complete definition because:

- (a) It does not explain when two differences are equal (e.g. why  $3 - 5 = 2 - 4$ , but  $3 - 5 \neq 1 - 6$ ).
- (b) It does not explain how to perform arithmetic on differences (e.g. how to add  $3 - 5$  and  $6 - 2$ ).
- (c) It is circular because subtraction is used before it is defined.

From algebra we know:

$$a - b = c - d \text{ if and only if } a + d = c + b.$$

Also:

$$(a - b) + (c - d) = (a + c) - (b + d)$$

$$(a - b)(c - d) = (ac + bd) - (ad + bc)$$

We therefore define integers using only addition.

To avoid circularity, we introduce a new notation:

Instead of writing  $a - b$ , we treat it as a formal expression  $a - b$  where the dash is just a symbol, not real subtraction.

Definition 4.1.1 (Integers)

An integer is an expression  $a - b$  where  $a$  and  $b$  are natural numbers.

Two integers are equal if and only if:

$$a - b = c - d \text{ if and only if } a + d = c + b.$$

Let  $Z$  be the set of all integers.

Example:

$$3 - 5 = 2 - 4 \text{ because } 3 + 4 = 2 + 5.$$

$$\text{But } 3 - 5 \neq 2 - 3.$$

We must check this is a valid definition of equality (reflexive, symmetric, transitive, substitution).

We define operations:

Definition 4.1.2

Addition:

$$(a - b) + (c - d) = (a + c) - (b + d)$$

Multiplication:

$$(a - b)(c - d) = (ac + bd) - (ad + bc)$$

We must verify these are well-defined (they do not depend on representatives).

Lemma 4.1.3

Addition and multiplication are well-defined: replacing equal integers does not change results.

The proof uses algebraic manipulation of natural numbers.

We embed natural numbers into integers by:

$$n = n - 0$$

So natural numbers are identified with integers of form  $n - 0$ .

Negation:

Definition 4.1.4

$$-(a - b) = (b - a)$$

So:

- $n = 0 - n$

Trichotomy:

Every integer  $x$  is exactly one of:

- (a) 0
- (b) a positive natural number
- (c) the negative of a positive natural number

Thus integers are either positive, zero, or negative.

Algebra laws:

$$x + y = y + x$$

$$(x + y) + z = x + (y + z)$$

$$x + 0 = x$$

$$x + (-x) = 0$$

$$xy = yx$$

$$(xy)z = x(yz)$$

$$x(y + z) = xy + xz$$

Subtraction is defined as:

$$x - y = x + (-y)$$

Cancellation law:

If  $ac = bc$  and  $c \neq 0$ , then  $a = b$ .

Order:

$n \geq m$  if  $n = m + a$  for some natural number  $a$ .

Key properties:

- order preserved by addition
- order preserved by multiplication (positive case)
- negation reverses order
- trichotomy: exactly one of  $a > b$ ,  $a < b$ ,  $a = b$

Assignment 3. Translate into Serbian the excerpt from the story 'BLUE CLAY BLUES

*By Gwyneth Jones*

At the same moment Johnny understood that the truck, which he'd taken to be a mere accidental prop, was here on purpose. A chill and horror of excitement ran through him. He was afraid he was shivering visibly—but in fact he'd have had some excuse because just then the rain arrived. It fell over the whole scene like a roll of silk tossed down, as purple as it had looked on the horizon: scented and cold and shocking.

“What's your name, boy?”

“Johnny.”

“What d'you do?”

“Uh—I'm an engineer.”

“Looking for work? We could find you some. You need a wife to go with that kid. We got women too.”

This banter didn't mean anything. Johnny had discovered that everywhere you go in the boondocks, people will invite you to stay. It seemed a point of etiquette to regard any chance comer as a potential addition to the community. It wasn't something to worry about, no more than the equal number of brief acquaintances who invited you to take them home, see their kids through college, advance the capital for them to set up in business. Banter covered the positioning of the truck, the chaining up of Johnny's car, all under the hammering of the purple rain. Johnny, expressing decent but not effusive gratitude, got into the back with Bella, who woke as the car was being winched onto the flatbed. She didn't speak or wail but stared all around her mightily. He could tell she'd been dreaming.

“It's okay, Bel. The car broke down. These people are giving us a ride into town.”

“Daddy, why are you wet?”

“It's raining.”

Bella stared with eyes like saucers, and dawning appreciation of this new means of transport, this audience, this adventure. The bikers peered

Task for the student:

Translate the entire passage from English into Serbian, preserving the tone, dialogue, and meaning as closely as possible.