

SecurityTube Linux Assembly Expert (SLAE⁶⁴)



SecurityTube Linux Assembly Expert

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Module 1: 64-Bit ASM on Linux

15. Bit Shifting Instructions

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SHL/SAL

Initial State

CF

X

Operand

1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1 1

After 1-bit SHL/SAL Instruction

1

0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1 1 0

← 0

After 10-bit SHL/SAL Instruction

0

0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 0

← 0

Figure 7-6. SHL/SAL Instruction Operation

Reference: Intel Manual

SHR

Initial State

Operand

CF

1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1 1

X

After 1-bit SHR Instruction

0 →

0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1

1

After 10-bit SHR Instruction

0 →

0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0

0

Figure 7-7. SHR Instruction Operation

Reference: Intel Manual

SAR

Initial State (Positive Operand)

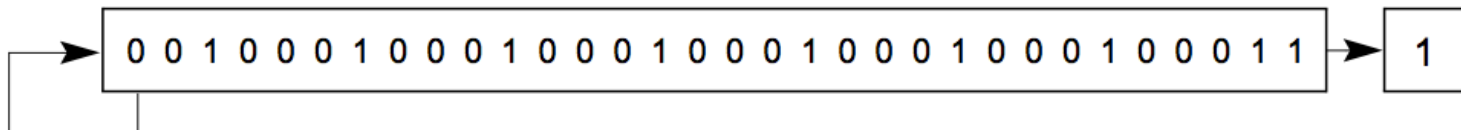
Operand

CF

0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1

X

After 1-bit SAR Instruction



Initial State (Negative Operand)

CF

1 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 1

X

After 1-bit SAR Instruction

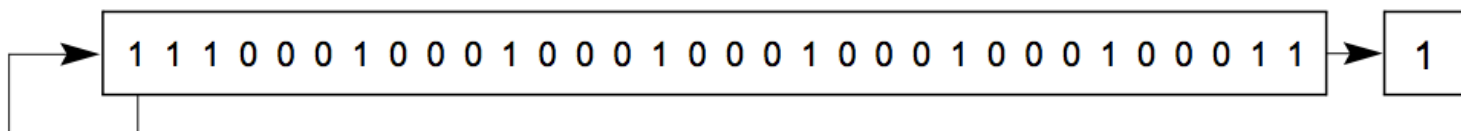


Figure 7-8. SAR Instruction Operation

Rotate Instructions

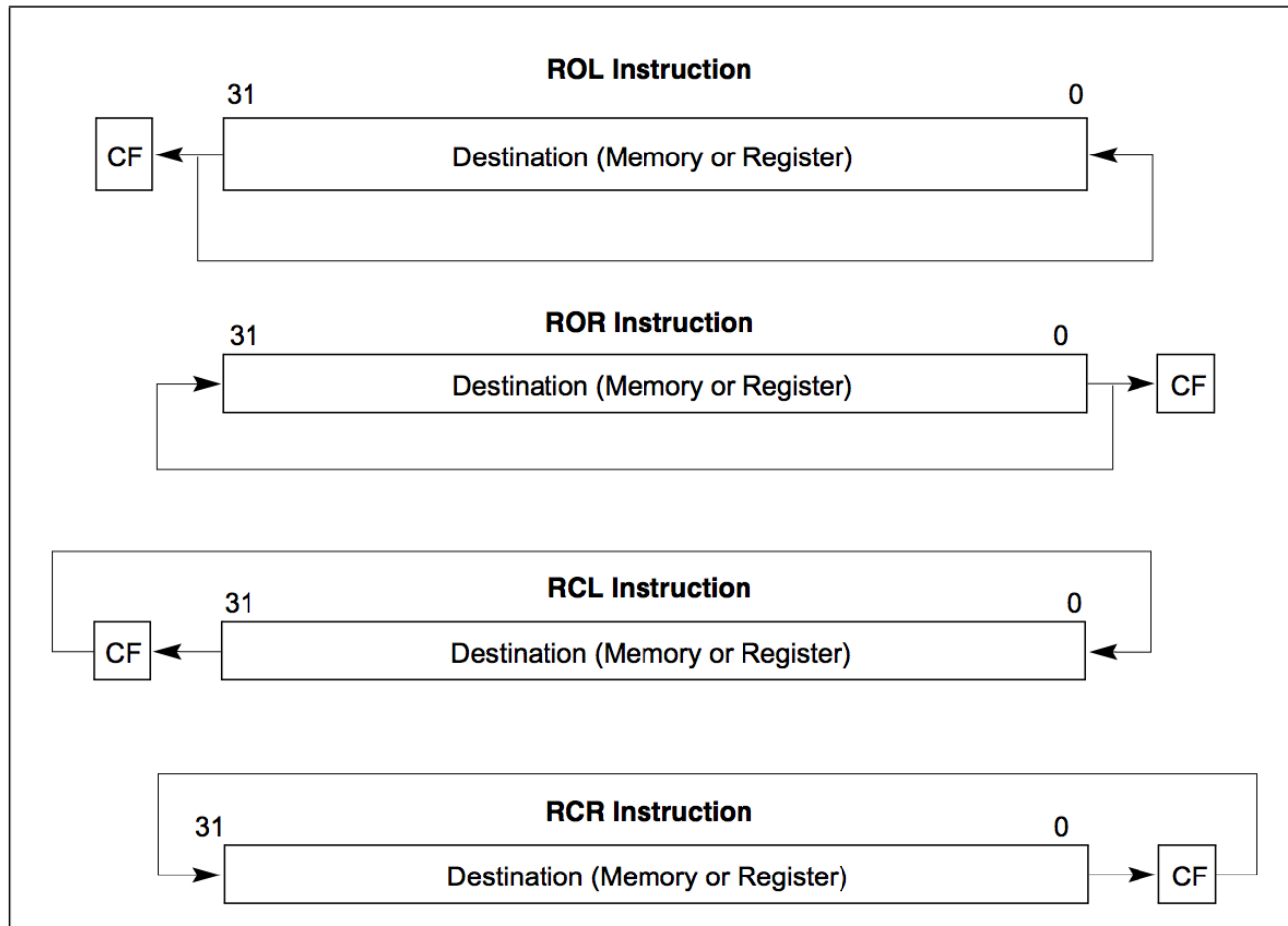


Figure 7-10. ROL, ROR, RCL, and RCR Instruction Operations

Reference: Intel Manual

Pentester Academy

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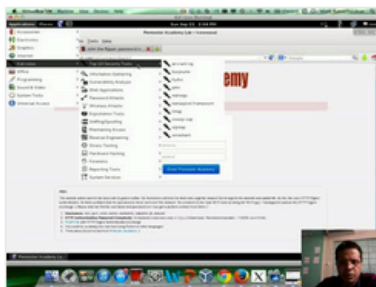
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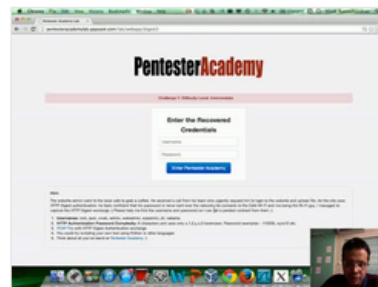
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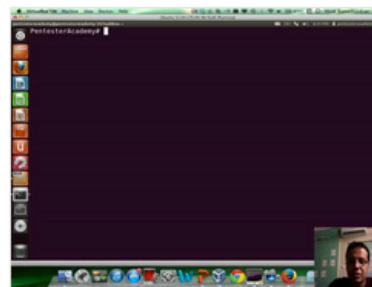
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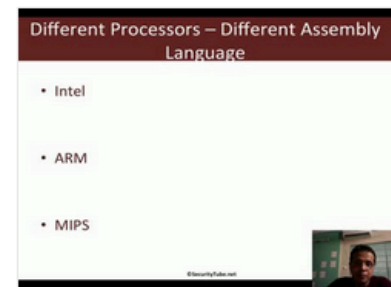
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Challenge 7: Cracking Digest Authentication in WAP Challenges



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Module 1: CPU Information in x86_64 Assembly Language and Shellcoding on Linux