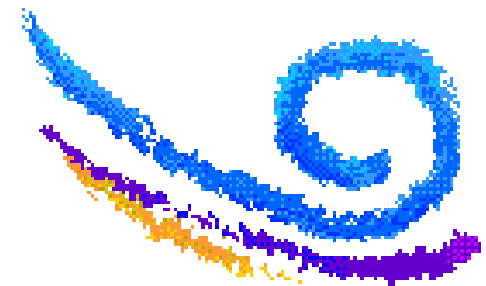


New Tricks for Old Dogs

Assembler Language - Big Picture

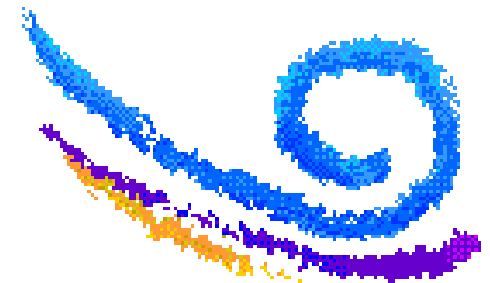
The Assembler - some changes

- ▶ Support for long data item names (up to 63 characters)
- ▶ Support for mixed case code
- ▶ Support for new data types
 - 64-bit integers
 - 64-bit addresses
 - Unicode character strings
 - IEEE floating point
- ▶ New Extended mnemonics (Jump)
- ▶ Labeled USINGs, dependent USINGs



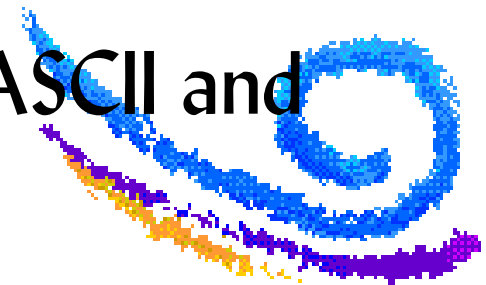
The Hardware - changes prior to z/Architecture

- ▶ Multiply Single (MSR, MS)
- ▶ Halfword Immediate (AHI, CHI, LHI, MHI, TMH, TML)
- ▶ Logical String Assist (CLST, CUSE, MVST, SRST)
- ▶ Extended long instructions (CLCLE, MVCLE, TRE)
- ▶ Relative Branching (BRAS, BRC, BRCT, BRXH, BRXLE)
- ▶ Unicode instructions (CUUTF, CUTFU)
- ▶ New floating point instructions (numerous)



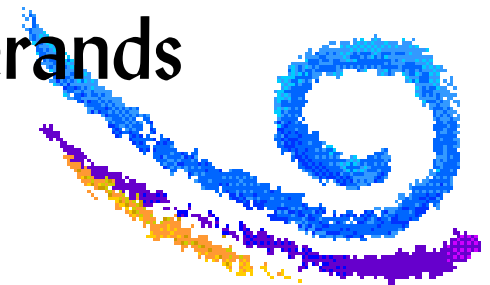
z/Architecture Instruction Additions

- ▶ Long branches - relative to current instruction
- ▶ Addressing mode switching and testing
- ▶ Specialized - EPSW
- ▶ Store and load instructions - all parts of 64-bit registers, from and to appropriate size memory locations
- ▶ ASCII support - pack and unpack
- ▶ Unicode support - pack and unpack
- ▶ Packed decimal instructions - TP plus the ASCII and Unicode pack and unpack



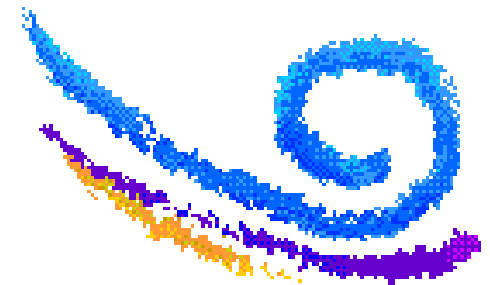
More z/Architecture Additions

- ▶ Binary arithmetic - combinations of 32-bit and 64-bit operands
- ▶ Logical binary - loading, storing, comparing, and logical arithmetic operations on 32-bit and 64-bit operands
- ▶ Bit-oriented instructions - ORs, ANDs and XORs of various size operands, new Test Under Mask variants
- ▶ Shift instructions - 64-bit operands
- ▶ Rotate instructions - 32-bit and 64-bit operands



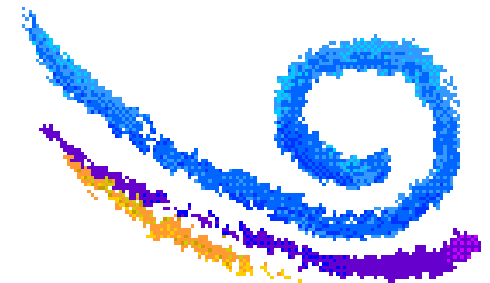
More z/Architecture Instructions

- ▶ Translate instructions - one or two byte inputs, one or two byte outputs
- ▶ Load / Store Reversed - to deal with endian issues
- ▶ Floating point <...> 64-bit integer conversions
- ▶ Classic_floating_point <...> IEEE_floating_point conversions



z/990 Instructions

- ▶ The advent of the z/990 machine introduced additional instructions (which are retrofitted to earlier z/Architecture machines)
 - Long displacement uses 20-bit displacements instead of the traditional 12 bits
 - Cryptographic instructions





6790 East Cedar Avenue, Suite 201
Denver, Colorado 80224
USA

<http://www.trainersfriend.com>

800.993.8716

303.393.8716

Sales: kitty@trainersfriend.com

Technical: steve@trainersfriend.com