# CSI TCP/IP for VSE Update

CSI International

Product Support and Development

*Don Stoever*

March 4th 2014

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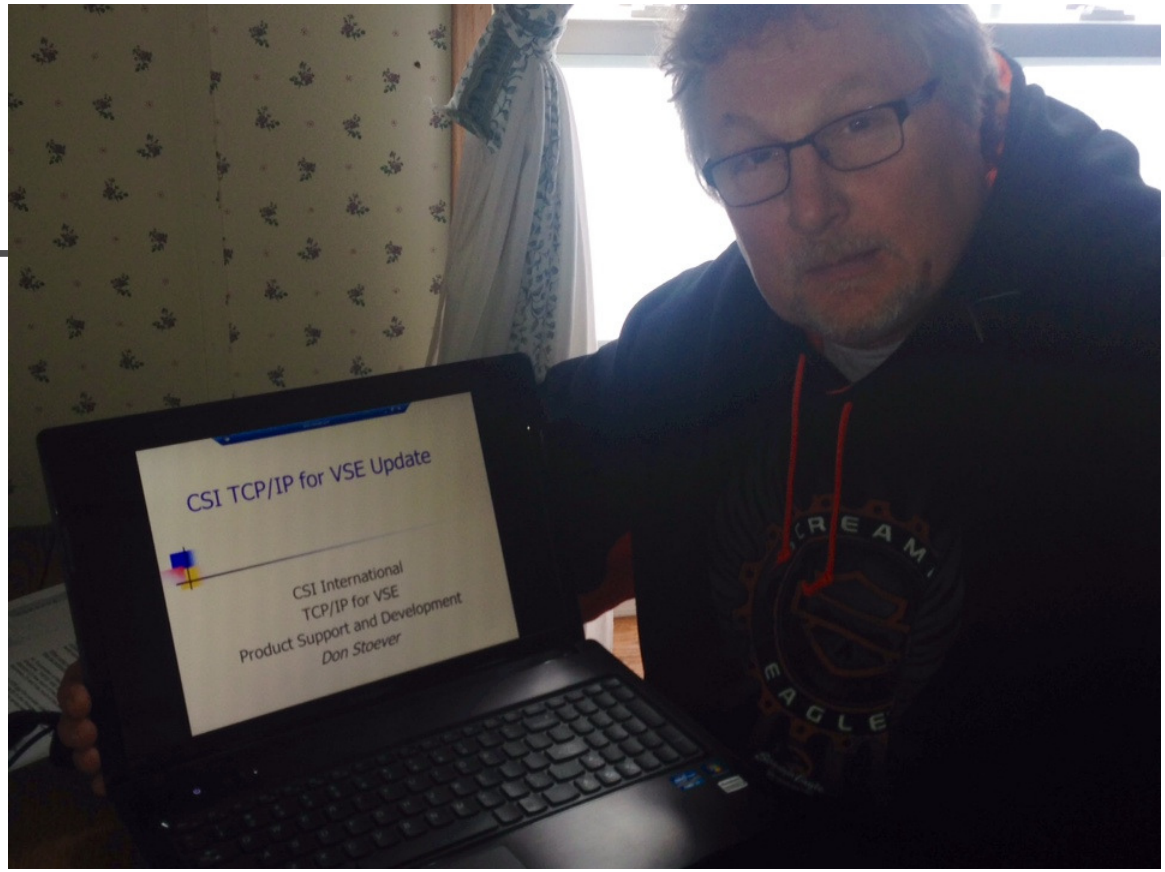


# CSI TCP/IP for VSE Update

Hello from the web!

Although the best place to meet personally is of course at WAVV or the GSE conference.

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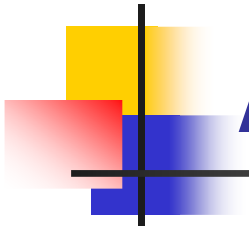

# Agenda

- Introduction
  - TCP/IP for VSE Functionality
- Service Packs
  - TCP/IP 1.5F
  - TCP/IP 1.5G
- New Functionality
- Service News
  - Zaps
- Hints and Tips
- TCP/IP Version 2
- Questions

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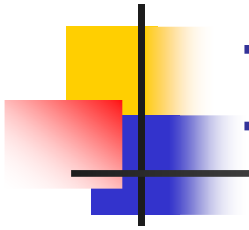

# Introduction

- TCP/IP for VSE Functionality
  - Putting VSE on IP networks since 1995
  - Extensive monitoring and tuning capabilities
  - Customizable security features
  - Built-in connection management
  - Servers for TN3270, FTP, LPD, and HTTPD
  - Client software such as FTP, LPR, Email, and Telnet
  - Additional support software
    - Automation, PDF creation, Language translation, and more…
  - Powerful API's for creating custom socket applications

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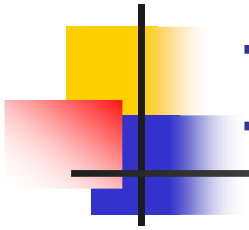

# Introduction

- TCP/IP for VSE Functionality
  - Additional optional features distributed with TCP/IP for VSE
  - GPS for General Print Server
  - SSL/TLS for Secure Sockets using cryptography
  - SecureFTP for SSL/TLS enabled FTP servers and clients
  - See-TCP/IP for performance monitoring
  - Ping, Trace Route, Discover, and other powerful tools for analyzing the IP network from VSE
  - Advanced diagnostics for detailed problem analysis

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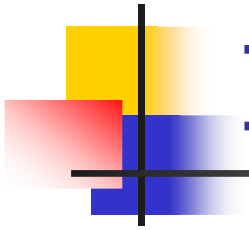

# Introduction

- TCP/IP for VSE Functionality
  - Easy to define and use file system for most VSE data structures including:
    - VSAM ESDS and KSDS
    - Librarian
    - Power
    - SAM – Disk and Tape
    - Epic controlled datasets
    - BIM-EDIT
    - ICCF
    - Other VSE resident files

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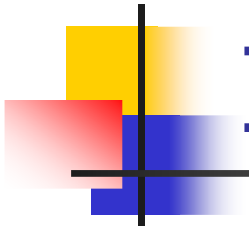

# Introduction

- CSI TCP/IP support and development has always made it a high priority to respond to IBM, Customers, Vendors, International Agents, and Consultants to real world customer problems, issues, and business needs.
- Fixes by definition are for defects that could cause abends, incorrect output, failed connections, poor performance, etc.
- But many fixes have also been created to enhance functionality.

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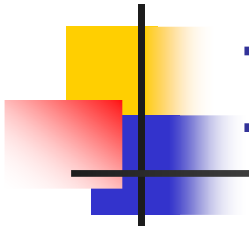

# Introduction

- Enhancement fixes were used as the vehicle to get it into the customer installation as quickly as possible without having to wait for a new release to be created.
- This commitment to quickly provide solutions to real world business problems will continue with future releases of TCP/IP for VSE from CSI International technical support and development.

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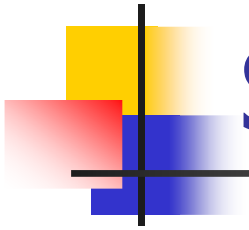

# Service Packs

- TCP/IP 1.5F
  - Pre-Applied Service Pack dated 2013/11/27
  - Contains all production fixes as of 11/27
- TCP/IP 1.5G*
  - Pre-Applied Service Pack dated 2014/01/05
  - Contains all production fixes as of 01/05
- New Pre-Applied coming based on number of new production zaps issued

* Not currently available from IBM

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# Service News 1.5F

- 1.5F supported in parallel with 1.5G
  - Same corrective fixes for F and G
  - 1.5G fixes are retrofitted into 1.5F
    - Restarted fix numbers at 001
  - 1.5F fixes are retrofitted into 1.5G
    - Random fix numbers almost exhausted
  - Pre-Applied Service Pack dated 2013/11/27
    - Contains all production fixes as of 11/27

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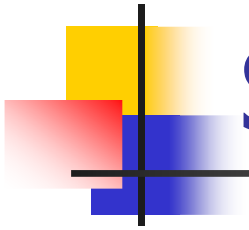

# Service News 1.5G*

- 1.5G* is a new modification level of v1r5
  - Same base source as 1.5F
    - Re-assembled and re-linked
    - 1.5G eye-catchers
    - 1.5F fixes integrated
  - Same doc as 1.5F
    - See $ReleaseNotes15G for differences
    - New set of 1.5F/G doc is being worked on
  - 1.5G Zap numbers increase numerically!

* Not currently available from IBM

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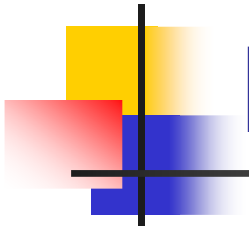

# New Functionality

- External Socket Requests
  - Use 31-bit private getvis to provide:
    - Better Efficiency
    - Better Performance
    - Better Reliability
    - Better Control

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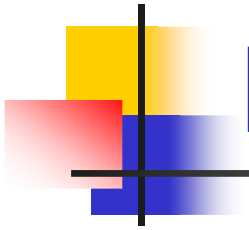

# External Socket Requests

- New Command
  - EXTPGVS OFF (default in 1.5F)
    - External TCP socket requests allocated in shared 31-bit system getvis
    - Single queue for all external partitions
  - EXTPGVS ON (default in 1.5G)
    - External TCP socket requests allocated in private 31-bit partition getvis
    - Separate queue for each external partition
  - Why different defaults?

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# External Socket Requests

- $SOCKOPT Options
  - Used to generate $SOCKOPT.PHASE for customizable set of options
    - Cdloaded at run time for external socket applications
  - SOCFLG1=$OPTPGSB
    - Setting will use 31-bit partition getvis for allocating socket request blocks
  - Alternate method to global EXTPGVS setting

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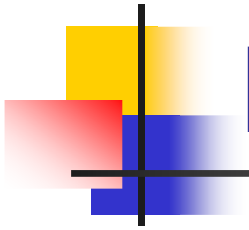

# External Socket Requests

- A new program($BSOCKET) is CDLOADed during the initial socket request of an external partition
  - Provides services that run under the control of the external socket application partition
  - Allocates and anchors a new PXBLOK in the partition COMREG-IJBTCPP2 reserved word
  - Detects new job step start time and initializes counters and socket queue requests

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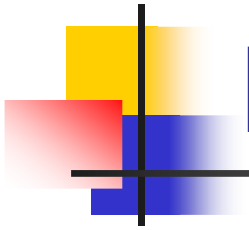

# External Socket Requests

- Query Externals be used to obtain statistics about external partition socket activity:
  - IPN684I F4 PXBLOK:058EED00 PIK:0090 TIK:0025 STACK:01
  - IPN685I F4 last socket job step 12:35:31.880
  - IPN686I F4 csoc=33 + ntcp=0 = 33
  - IPN687I F4 spas=39 + async=0 + ntlk=0 = 39
  - IPN688I F4 Socket requests(33) do not match posts(29) asoc(33)
  - IPN689I F4 Total passive opens(37) successful connects(4)
  - IPN694I F4 12 TCP requests for other stacks
- Statistics for individual partitions

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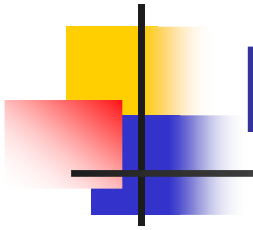

# External Socket Requests

- IPN684I F4 PXBLOK:058EED00 PIK:0090 TIK:0025 STACK:01
  - Information about the associated external socket partition
- IPN685I F4 last socket job step 12:35:31.880
  - identifies the external job step start time
- IPN686I F4 csoc=33 + ntcp=0 = 33
  - csoc= is the total number of TCP external socket requests from the external partition to the TCP/IP partition
  - ntcp= is the total number of non-TCP requests from the external partition
- IPN687I F4 spas=39 + async=0 + ntlk=0 = 39
  - spas= is the total number of non-asynchronous external socket requests posted
  - async= is the total number of asynchronous external socket requests posted
  - ntlk= is the total number of notalk=yes and fast=yes socket requests. The ECB associated with these types of socket requests is immediately posted before the request has even been fully processed by the TCP/IP partition

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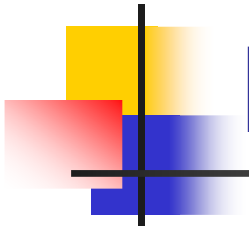

# External Socket Requests

- IPN688I F4 Socket requests(33) do not match posts(29) asoc(33)
  - is only issued when the number of socket requests does not match the number of posts. Although this can indicate a problem it can also be normal for an application to have some passive open listens or receives outstanding, but if the number is excessively high or is continually growing larger, then the socket application should be analyzed for possible processing and logic problems.
- IPN689I F4 Total passive opens(37) successful connects(4)
  - is only issued when passive (listen state) opens are detected, and contains the number of passive opens issued and the number of connections that have been established. Passive opens are normally used by server socket applications and these numbers indicate the number of connections that have occurred.
- IPN694I F4 12 TCP requests for other stacks
  - Is only issued when a single partition has made socket requests to different stacks.
  - The primary connected stack is indicated in the prior IPN684 message

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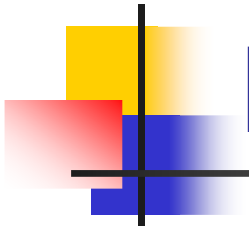

# New Functionality

- AUTOSEND*
  - New batch utility to externalize automation client
  - Takes as input the DEFINE EVENT command
  - Internal DEFINE EVENT still supported
  - But do not monitor same Power class with both internal and external define event

* Not currently available from IBM

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# New Functionality

- AUTOSEND*
  - Why?
  - Segregate work load
  - Isolate storage
  - Run multiple partitions with separate events
    - Exploit multiple processors

* Not currently available from IBM

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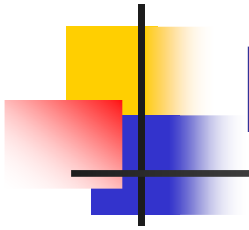

# New Functionality

- See-TCP/IP
  - Higher focus on connection-centric data
  - More extensive real-time displays including
    - Network efficiency
    - Network transfer rates
  - Higher level of detail based on
    - Network protocol
    - VSE port numbers
    - Connection states

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# New Functionality

- See-TCP/IP
  - Improved capability for data filtering & drill down
  - Improved packet capture for network analysis
  - Storing of historical data is optional

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# New Functionality

- New CIALSHPH batch utility can be used to verify the phases have a matching SHA-1 hash
- Table of current hash values distributed for pre-applied service packs
- Uses cryptographic message digest to guarantee data integrity
- What's next maybe digital signatures?

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# Service News

- 1.5F supported in parallel with 1.5G
  - Same corrective fixes for F and G
  - 1.5G fixes are retrofitted into 1.5F
    - Restarted fix numbers at 001
  - 1.5F fixes are retrofitted into 1.5G
    - Random fix numbers almost exhausted
  - Pre-Applied Service Pack dated 2013/11/27
    - Contains all production fixes as of 11/27

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# Service News Zaps

- ZP15G000 = ZP15F495
- IPNET phase replacement
  - Included in G 2014/01/05 Pre-Applied
  - Included in F 2013/11/27 Pre-Applied
    - ZP15F495.zip contained coreq zaps
    - Some have been superseded…
  - Better support for
    - External Socket Requests

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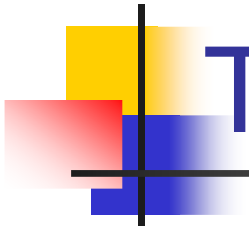

# TCP/IP 1.5F/G Zaps

- ZP15G001 = ZP15F113
  - CSOCKET phase replacement
    - Superseded by ZP15G026
- ZP15G002 = ZP15F125
  - ASOCKET phase replacement
    - Superseded by ZP15G015
- Changed to support EXTPGVS ON

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# TCP/IP 1.5F/G Zaps

- ZP15G003 = ZP15F176
  - CMDEXEC phase replacement
    - New commands
    - Superseded by ZP15G026
- ZP15G004 = ZP15F200
  - MSKELIP  phase replacement
    - New messages

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# TCP/IP 1.5F/G Zaps

- ZP15G005 = ZP15F217
  - CLIENTD phase replacement
  - Provides corrections and support for new external automation(AUTOSEND)
    - Superseded by ZP15G020, ZP15G027, ZP15G027, ZP15G029
    - Superseded by ZP15F094, ZP15F098, ZP15F217, ZP15F272

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# TCP/IP 1.5F/G Zaps

- ZP15G006 = ZP15F093
  - IPNACMEM phase replacement
    - Correction for abend during attach
- ZP15G007 = ZP15F089
  - IPNAFTPC phase replacement
    - Allow for setting longer variables values

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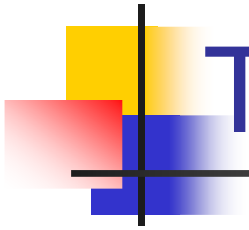

# TCP/IP 1.5F/G Zaps

- ZP15G008 = ZP15F091
  - GPSD phase replacement
    - Correct abend caused by bad data
    - Superseded by ZP15G019, ZP15G023

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# TCP/IP 1.5F/G Zaps

- ZP15G009 = ZP15Fnnn
  - IPNASEQA phase replacement
- ZP15G010 = ZP15Fnnn
  - IPNFESDS phase replacement
- Changed IPF207 from diagnostic to informational level message as it was in 1.5E
- Important for customer automation

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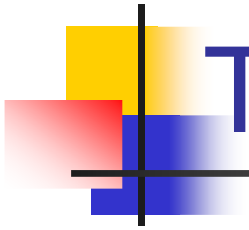

# TCP/IP 1.5F/G Zaps

- ZP15G011 = ZP15F086
  - CLIENT phase replacement
    - Corrections for RC when printing multiple entries
- ZP15G012 = ZP15F087
  - IPNACMLP phase replacement
    - Coreq with CLIENT zap
    - See zap description for details

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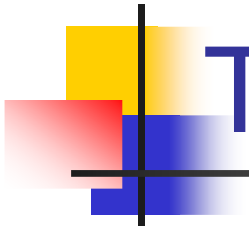

# TCP/IP 1.5F/G Zaps

- ZP15G013 = ZP15F173
  - IPNAFTP phase replacement
    - Correction for close processing
- ZP15G014 = ZP15F097
  - IPNFPOWR phase replacement
    - Correction for GETVIS failure recovery

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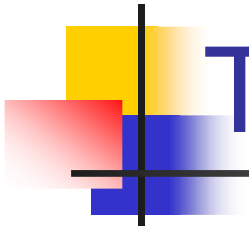

# TCP/IP 1.5F/G Zaps

- ZP15G015 = ZP15F125
  - ASOCKET phase replacement
    - Corrects abend when called from 24-bit application
- ZP15G016 = ZP15F187
  - IPNTYTCP phase replacement
    - Correction for open failure by setting the foreign ip address to 127.0.0.1 when the passed ip address is all zeros

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# TCP/IP 1.5F/G Zaps

- ZP15G017 = ZP15F168
  - FTPDAEMN phase replacement
    - Remove pulse on until fully open
    - Still in test status
- ZP15G018 = ZP15F111
  - IPNACONT phase replacement
    - Added GETVENDORINFO

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# TCP/IP 1.5F/G Zaps

- ZP15G019 = ZP15F090
  - GPSD phase replacement
    - Superseded by ZP15G023
    - Superseded by ZP15F091
- ZP15G020 = ZP15F098
  - CLIENTD  phase replacement
    - Superseded by ZP15G027, ZP15G029
    - Superseded by ZP15F217, ZP15F272

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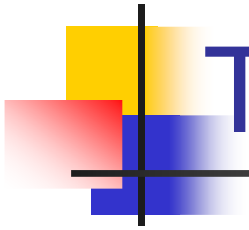

# TCP/IP 1.5F/G Zaps

- ZP15G021 = ZP15F100
  - IPDRIVER phase replacement
    - Issue message on timer error
- ZP15G022 = ZP15Fnnn
  - IPCRYPTO phase replacement
    - Correction for abend due to a chaining error
- ZP15G023 = ZP15F091
  - GPSD phase replacement

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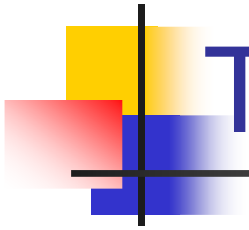

# TCP/IP 1.5F/G Zaps

- ZP15G024 = ZP15F113
  - CSOCKET phase replacement
    - Handle fast send checksum failure
- ZP15G025 = ZP15F199
  - $BSOCKET phase replacement
    - Clear counter and stack id

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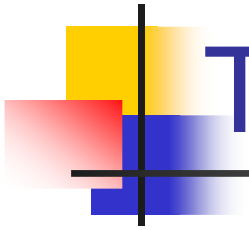

# TCP/IP 1.5F/G Zaps

- ZP15G026 = ZP15F176
  - CMDEXEC phase replacement
    - Updated Query External command to display counter of requests for other stacks
    - Sample message:
      - IPN694I S1 17 TCP requests for other stacks
    - Only occurs when a single partition is connected to multiple stacks

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# TCP/IP 1.5F/G Zaps

- ZP15G027 = ZP15F217
  - CLIENTD phase replacement
    - Can run in batch partition with AUTOSEND
    - Superseded by ZP15G029
    - Superseded by ZP15F272
- ZP15G028 = ZP15F284
  - AUTOSEND new phase
    - Utility to load run batch automation daemon(CLIENTD) in an external partition
    - Superseded by ZP15G030

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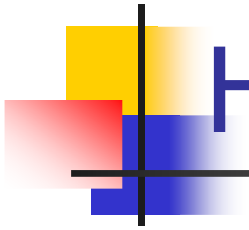

# Hints and Tips

- Use weighted balanced partitions with TCP/IP having a higher weight than the socket application partitions.
- Example with TCP/IP running in F8:
- PRTY BG=FB=FA=F7=F6=F5=F4=F3=F2=C=P=R=W=S=Y=Z=T=F8,F9,F1
- PRTY SHARE,BG=100,F2=100,F3=100,F4=100,F8=400
- The workload of applications and TCP/IP should be viewed as a single unit of work. This is from stress testing that is performed on our system by using 72 simultaneous FTPBATCH jobs.

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# Hints and Tips

- More hints and tips can be obtained from the new redbook
- Enhanced Networking on IBM z/VSE  SG24-8091
  - http://www.redbooks.ibm.com/
- Consider using external ftpbatch servers
- Implement other features
  - Automatic security
  - Stealth ON
  - DIAG CONNREJ
  - DIAG GETVIS

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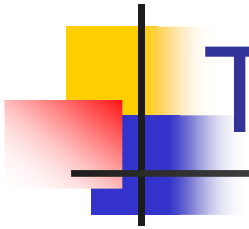

# TCP/IP 2.0*

- IPv6 Support
- Internal Development Work being performed

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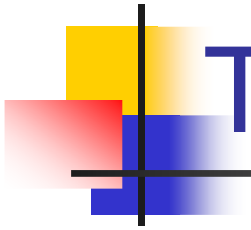

# TCP/IP 2.0*

- Enhanced Socket Assembler API provides:
  - Support for 16-byte IP addressing required by IPv6
  - Broader control over connections
  - Problem determination easier with advanced diagnostics
  - Draft Programmers Guide contains details for using the Enhanced Socket Assembler API

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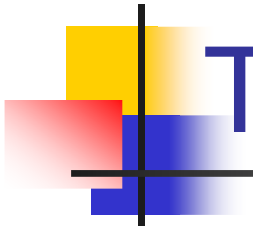

# TCP/IP 2.0

- Basic Socket Interface(BSDI) has been enhanced to support IPv6 addresses
  - Draft Programmers Guide available for details on using the enhanced BSD Socket Interface
- Applications should be converted to use the enhanced socket interfaces in preparation for supporting IPv6 addresses

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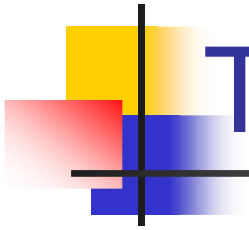

# TCP/IP 2.0

- New CSISTACK batch utility can be used to load and control the enhanced socket interface

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# Questions ?

- Email to support@csi-international.com
- don@e-vse.com

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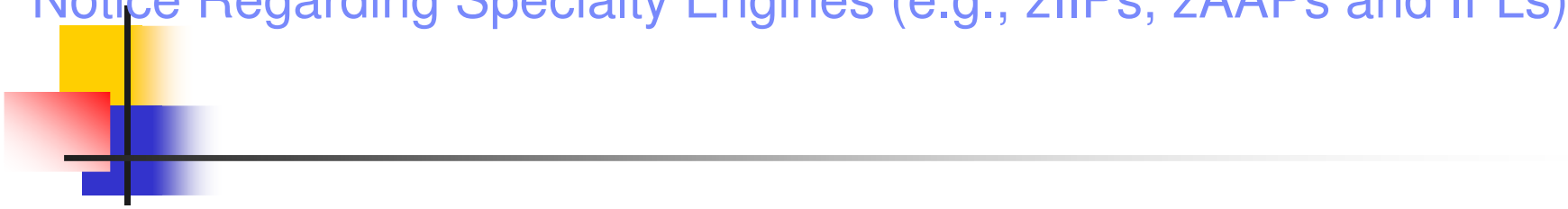

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